# STIC Search Report

EIC 1700

6B59

STIC Database Tracking Number: 122741

TO: Raymond Alejandro
Location:
Art Unit : 1745
May 27, 2004

Case Serial Number: 10/083606

From: Barba Koroma
Location: EIC 1700
REM EO4 A30
Phone: 571 272 2546

barba.koroma@uspto.gov

## Search Notes

Examiner Alejandro,
Please find attached results of the search you requested. Various components of the invention as spelt out in the claims and search request were searched in multiple databases.

For your convenience, titles of hits have been listed to help you peruse the results set quickly. This is followed by a detailed printout of records. Please let me know if you have any questions.
Thanks.

Access DB# 122741

# SEARCH REQUEST FORM

**Scientific and Technical Information Center**

Requester's Full Name: Raymond Alejandro Examiner # : 76895 Date: 05/21/04
Art Unit: 1745 Phone Number 30 2-1282 Serial Number: 10/083606
Mail Box and Bldg/Room Location: Rem 6B-59 Results Format Preferred (circle): PAPER DISK E-MAIL

**If more than one search is submitted, please prioritize searches in order of need.**

*************************************************************************************

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Fuel Cell System, & Method of Protecting a Fuel Cell from Freezing

Inventors (please provide full names): Yoshizawa et al

Earliest Priority Filing Date: 02/27/02

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Please, search for subject matter of claims 1-53.

*************************************************************************************

| **STAFF USE ONLY** | **Type of Search** | | **Vendors and cost where applicable** | |
|---|---|---|---|---|
| Searcher: | NA Sequence (#) | | STN | |
| Searcher Phone #: | AA Sequence (#) | | Dialog | |
| Searcher Location: | Structure (#) | | Questel/Orbit | |
| Date Searcher Picked Up: | Bibliographic | | Dr.Link | |
| Date Completed: | Litigation | | Lexis/Nexis | |
| Searcher Prep & Review Time: | Fulltext | | Sequence Systems | |
| Clerical Prep Time: | Patent Family | | WWW/Internet | |
| Online Time: | Other | | Other (specify) | |

PTO-1590 (8-01)

=> file caplus
FILE 'CAPLUS' ENTERED AT 16:12:24 ON 27 MAY 2004


FILE COVERS 1907 - 27 May 2004  VOL 140 ISS 22
FILE LAST UPDATED: 26 May 2004  (20040526/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> file wpix
FILE 'WPIX' ENTERED AT 16:12:28 ON 27 MAY 2004


FILE LAST UPDATED:            25 MAY 2004      <20040525/UP>
MOST RECENT DERWENT UPDATE:      200433         <200433/DW>
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    http://www.thomsonscientific.com/litalert           <<<

>>> THE DISPLAY LAYOUT HAS BEEN CHANGED TO ACCOMODATE THE
    NEW FORMAT GERMAN PATENT APPLICATION AND PUBLICATION
    NUMBERS. SEE ALSO:
    http://www.stn-international.de/archive/stnews/news0104.pdf <<<

>>> SINCE THE FILE HAD NOT BEEN UPDATED BETWEEN APRIL 12-16
    THERE WAS NO WEEKLY SDI RUN  <<<

=> file japio
FILE 'JAPIO' ENTERED AT 16:12:33 ON 27 MAY 2004
COPYRIGHT (C) 2004 Japanese Patent Office (JPO)- JAPIO

FILE LAST UPDATED: 14 MAY 2004       <20040514/UP>
FILE COVERS APR 1973 TO JANUARY 29, 2004

<<< GRAPHIC IMAGES AVAILABLE >>>

=> d que l88
L36          648 SEA FILE=CAPLUS ABB=ON  PLU=ON  FUEL(3A)CELL AND PROTECT?
L37            7 SEA FILE=CAPLUS ABB=ON  PLU=ON  FUEL(3A)CELL AND PROTECT? AND
                 (FREEZ? OR FROZ?)
L38        19385 SEA FILE=CAPLUS ABB=ON  PLU=ON  WATER(5A)PASS?
L39          312 SEA FILE=CAPLUS ABB=ON  PLU=ON  FUEL CELL AND L38
L40          528 SEA FILE=CAPLUS ABB=ON  PLU=ON  FUEL CELL(L)PROTECT?
L42            7 SEA FILE=CAPLUS ABB=ON  PLU=ON  FUEL CELL(L)PROTECT? AND
                 (FREEZ? OR FROZ?)
L43            1 SEA FILE=CAPLUS ABB=ON  PLU=ON  L40 AND L39
L44           11 SEA FILE=CAPLUS ABB=ON  PLU=ON  PREVENT?(4A)FREEZ? AND (L36 OR
                 L37 OR L39)
L45           15 SEA FILE=CAPLUS ABB=ON  PLU=ON  L42 OR L44
L46            4 SEA FILE=CAPLUS ABB=ON  PLU=ON  (L36 OR L40) AND CONTROLLER?
L47           10 SEA FILE=CAPLUS ABB=ON  PLU=ON  (L36 OR L40) AND HEATER?
L48            6 SEA FILE=CAPLUS ABB=ON  PLU=ON  (L36 OR L40) AND HEAT?(4A)INSUL
                 AT?
L49            2 SEA FILE=CAPLUS ABB=ON  PLU=ON  (L36 OR L40) AND TEMP?(5A)DROP?

L50            0 SEA FILE=CAPLUS ABB=ON  PLU=ON  (L36 OR L40) AND WATER(4A)RESER
                 V?
L51           66 SEA FILE=CAPLUS ABB=ON  PLU=ON  (L36 OR L40) AND REFORM?
L52           30 SEA FILE=CAPLUS ABB=ON  PLU=ON  (L36 OR L40) AND REFORMER?
L53            2 SEA FILE=CAPLUS ABB=ON  PLU=ON  (L36 OR L40) AND REFORMATE(4A)G
                 AS
L54          137 SEA FILE=CAPLUS ABB=ON  PLU=ON  (L36 OR L40) AND (HYDROGEN OR
                 H2)
L55           73 SEA FILE=CAPLUS ABB=ON  PLU=ON  (L36 OR L40) AND POROUS?
L56           10 SEA FILE=CAPLUS ABB=ON  PLU=ON  (L36 OR L40) AND WATER(4A)GAS
L57            1 SEA FILE=CAPLUS ABB=ON  PLU=ON  (L36 OR L40) AND MEASURE?(5A)TE
                 MP?
L58           36 SEA FILE=CAPLUS ABB=ON  PLU=ON  (L36 OR L40) AND SENSOR?
L59            0 SEA FILE=CAPLUS ABB=ON  PLU=ON  (L36 OR L40) AND PREDICT?(5A)RE
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                        START?
L60             22 SEA FILE=CAPLUS ABB=ON  PLU=ON  (L36 OR L40) AND PROTECT?(4A)DE
                   VICE
L62            280 SEA FILE=CAPLUS ABB=ON  PLU=ON  (L42 OR L43 OR L44 OR L45 OR
                   L46 OR L47 OR L48 OR L49 OR L50 OR L51 OR L52 OR L53 OR L54 OR
                   L55 OR L56 OR L57 OR L58 OR L59 OR L60)
L63              1 SEA FILE=CAPLUS ABB=ON  PLU=ON  L62 AND (OUTSIDE OR EXTERNAL)(5
                   A)AIR TEMP?
L64             16 SEA FILE=CAPLUS ABB=ON  PLU=ON  L62 AND BATTER?
L65              0 SEA FILE=CAPLUS ABB=ON  PLU=ON  L62 AND CHARGE(4A)STATE
L66              3 SEA FILE=CAPLUS ABB=ON  PLU=ON  L62 AND (FIRST OR SECOND)(5A)PR
                   OTECT?
L67              0 SEA FILE=CAPLUS ABB=ON  PLU=ON  L62 AND (RESERVE OR RESERVOIR?)

L68              1 SEA FILE=CAPLUS ABB=ON  PLU=ON  L62 AND WATER(4A)DRAIN?
L69              0 SEA FILE=CAPLUS ABB=ON  PLU=ON  L62 AND WATER(4A)THAW?
L70              0 SEA FILE=CAPLUS ABB=ON  PLU=ON  L62 AND STOP(4A)INTERVAL
L71              3 SEA FILE=CAPLUS ABB=ON  PLU=ON  L62 AND INTERVAL
L72              0 SEA FILE=CAPLUS ABB=ON  PLU=ON  L62 AND INTERMISSION
L73              0 SEA FILE=CAPLUS ABB=ON  PLU=ON  L62 AND PAST INFO?
L74              0 SEA FILE=CAPLUS ABB=ON  PLU=ON  L62 AND PAST(4A)INFO?
L75              4 SEA FILE=CAPLUS ABB=ON  PLU=ON  L62 AND SIGNAL?
L76              0 SEA FILE=CAPLUS ABB=ON  PLU=ON  L62 AND REMAIN?(5A)ELECTRIC?
L77              1 SEA FILE=CAPLUS ABB=ON  PLU=ON  L62 AND DETECT?(5A)(OXYGEN OR
                   O2)
L78              1 SEA FILE=CAPLUS ABB=ON  PLU=ON  L62 AND (OXYGEN OR O2)(5A)CONC?

L79             29 SEA FILE=CAPLUS ABB=ON  PLU=ON  (L63 OR L64 OR L65 OR L66 OR
                   L67 OR L68 OR L69 OR L70 OR L71 OR L72 OR L73 OR L74 OR L75 OR
                   L76 OR L77 OR L78)
L82              6 SEA FILE=WPIX ABB=ON  PLU=ON  FUEL CELL(5A)(PROTEC? OR PREVENT
                   DAMAGE)(5A)(FREEZ? OR FROZEN)
L83              4 SEA FILE=WPIX ABB=ON  PLU=ON  L82 AND (DETECT? OR CONTROL? OR
                   DRAIN? OR REGULAT?)(5A)(TEMP? OR WATER)
L86              2 SEA FILE=JAPIO ABB=ON  PLU=ON  L82 AND (DETECT? OR CONTROL? OR
                   DRAIN? OR REGULAT?)(5A)(TEMP? OR WATER)
L88             34 DUP REM L79 L83 L86 (1 DUPLICATE REMOVED)


=> d ti 1-34 l88
YOU HAVE REQUESTED DATA FROM FILE 'CAPLUS, WPIX, JAPIO' - CONTINUE? (Y)/N:y
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L88 ANSWER 1 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Method and apparatus for **fuel cell protection**

L88 ANSWER 2 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Moisture detection device

L88 ANSWER 3 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1
TI **Fuel cell** system, and method of **protecting** a

**fuel cell** from **freezing**

L88 ANSWER 4 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Fuel cell** system and **protection** method
thereof

L88 ANSWER 5 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Electrode current collectors for solid oxide **fuel cells**

L88 ANSWER 6 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Protection device** for a **fuel cell**
system

L88 ANSWER 7 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Active material for electrochemical cell anodes incorporating an additive
for precharging/activation thereof

L88 ANSWER 8 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Fuel **reforming** apparatus and method of starting it

L88 ANSWER 9 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Circuit wire/contact structure for thin-film **heaters** and
fabrication of structure thereof

L88 ANSWER 10 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Fuel cell** having an anode **protected** from
high **oxygen** ion **concentration**

L88 ANSWER 11 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Fuel cell** system with drainage line for the removal of
condensate from the storage tank

L88 ANSWER 12 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI A viable niche market - **fuel cell** scooters in Taiwan

L88 ANSWER 13 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Technical assessment of **fuel cell** operation on
landfill gas at the Groton, CT, landfill

L88 ANSWER 14 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Ion conducting ceramic electrolytes: A century of progress

L88 ANSWER 15 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Carbon monoxide detection and purification system for **fuel
cells**

L88 ANSWER 16 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Electromotive vehicle. [Machine Translation].

L88 ANSWER 17 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Fuel cell** system and **fuel cell**
operational method. [Machine Translation].

L88 ANSWER 18 OF 34 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI **Freezing protection** for electro-chemical battery ( **fuel cell**) with proton exchange membrane, has electrical resistance heater fed from fuel cell, separate batteries and electrical network.

L88 ANSWER 19 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Effect of crown ethers on the conduction of plasticized polyacrylonitrile-based electrolytes

L88 ANSWER 20 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Technical performance and cost-relevant parameters of stationary SOFC- and PEMFC-systems in households and hotels

L88 ANSWER 21 OF 34 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Fuel cell system for vehicles includes an alcohol source of low molecular weight, e.g. methanol, which is supplied upon shutdown of the cell to protect against freezing.

L88 ANSWER 22 OF 34 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Fuel cell system for e.g. moving vehicle, has pump and coolant branch pipe that collect coolant currently pooled in fuel cell based on **detection** signal of **temperature** monitoring unit.

L88 ANSWER 23 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Substantially fluorinated ionomers, their manufacture and use in conductive compositions

L88 ANSWER 24 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Resilient seal for membrane electrode assembly (MEA) in electrochemical **fuel cell** and fabrication of MEA with this seal

L88 ANSWER 25 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Hydrogen** absorbing alloy film composites for **battery** anodes and **fuel cells**

L88 ANSWER 26 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Application of rare earth containing solid state ionic conductors in electrolytes

L88 ANSWER 27 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI The vision of ionics

L88 ANSWER 28 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Contribution of electrochemistry to energy conservation and saving and environmental **protection**

L88 ANSWER 29 OF 34 JAPIO (C) 2004 JPO on STN
TI **FREEZING PROTECTION** DEVICE FOR **FUEL CELL** POWER GENERATION PLANT

L88 ANSWER 30 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Halogen-fueled organic electrolyte **fuel cell**

L88 ANSWER 31 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Sealed nickel-**hydrogen** secondary cell

L88 ANSWER 32 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Hydrogen** electrodes with preactivated Raney powder as catalyst

L88 ANSWER 33 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
TI Coating gas diffusion electrodes for **batteries** and **fuel cells**

L88 ANSWER 34 OF 34 JAPIO (C) 2004 JPO on STN
TI FUEL CELL SYSTEM

=> d all hitstr 1-34 l88
YOU HAVE REQUESTED DATA FROM FILE 'CAPLUS, WPIX, JAPIO' - CONTINUE? (Y)/N:y

L88 ANSWER 1 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2004:74173 CAPLUS
ED Entered STN: 29 Jan 2004
TI Method and apparatus for **fuel cell protection**
IN Xie, Chenggang; Hallmark, Jerald A.
PA Motorola, Inc., USA
SO PCT Int. Appl.
CODEN: PIXXD2
DT Patent
LA English
IC ICM H01M008-00
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | WO 2004010522 | A2 | 20040129 | WO 2003-US20683 | 20030630 |

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRAI US 2002-202594 A 20020724
AB A **fuel cell** system is **protected** by monitoring at least one **fuel cell** parameter, comparing the parameter to a preset level, and disconnecting or reconnecting a main

load in response to the **fuel cell** parameter. For example, a **fuel cell** system (300) is provided with a **protection** circuit (304, 308) that prevents operation of the **fuel cells** in the negative dP/dI region. System (300) includes a stack of **fuel cells** (302) connected in series and coupled to a main load (310). A **controller** (304) provides a control **signal** (314) based on the individual **fuel cell** voltage levels falling above or below a preset level. Control **signal** (314)is used to control a load switch (308)coupled between the stack of **fuel cells** (302) and the main load (310). The load switch (308) disconnects the main load (310) in order to prevent operation of the **fuel cell cells** in the negative dP/dI region.

L88 ANSWER 2 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2004:271904 CAPLUS
DN 140:289972
ED Entered STN: 02 Apr 2004
TI Moisture detection device
IN Moriyama, Akinobu
PA Nissan Motor Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM G01N027-416
ICS G01N027-409; G01N027-41; G01N027-00; G01N027-12
CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 76
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | JP 2004101369 | A2 | 20040402 | JP 2002-263638 | 20020910 |
| PRAI | JP 2002-263638 | | 20020910 | | |

AB The device is suited for determination of water vapor or liquid water concentration for water/vapor control in **fuel cell** system. The measurement is performed using an O gas **sensor** containing a **heater** surrounded by a **porous protection** body. The **sensor** is heated ≥100 °C. When the guided sample **gas** without reaching liquid **water** level, the **sensor** output is corresponding to the water vapor only. While the guided sample **gas** reachs the liquid **water** level, the **sensor** response is corresponding to the total of the water vapor and the liquid water.
ST moisture detection device water vapor control **fuel cell** system
IT **Fuel cells**
Gas **sensors**
Vapors
Waters
(moisture detection device for water/vapor control in **fuel**

**cell** system)
IT 7782-44-7, **Oxygen**, analysis
RL: ANT (Analyte); ANST (Analytical study)
(moisture **detection** device for water/vapor control in
**fuel cell** system)
IT 1314-23-4, Zirconia, uses
RL: DEV (Device component use); USES (Uses)
(moisture detection device for water/vapor control in **fuel**
**cell** system)

L88 ANSWER 3 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1
AN 2003:676551 CAPLUS
ED Entered STN: 29 Aug 2003
TI **Fuel cell** system, and method of **protecting** a
**fuel cell** from **freezing**
IN Yoshizawa, Koudai; Iiyama, Akihiro; Higashi, Shugo; Hagans, Patrick L.
PA Nissan Motor Co., Ltd., Japan
SO U.S. Pat. Appl. Publ.
CODEN: USXXCO
DT Patent
LA English
IC ICM H01M008-04
NCL 429024000; 429026000; 429013000
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | US 2003162063 | A1 | 20030828 | US 2002-83606 | 20020227 |
| | WO 2003073547 | A2 | 20030904 | WO 2003-US5401 | 20030225 |

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRAI US 2002-83606 A 20020227
AB A **fuel cell** system includes a **fuel**
**cell** ( 1 ) having a **water passage** and
**passage** for **gas** required for power generation, a
**first protection device** ( 5, 10 ) which
**prevents freezing** of water in the **fuel**
**cell** by maintaining the temperature of the **fuel**
**cell** ( 1 ), and a **second protection**
**device** ( 11, 12 ) which **prevents freezing** of
water in the **fuel cell** by discharging the water in the
**fuel cell** ( 1 ). A **controller** ( 50 ) selects
one of the **first protection device** ( 5, 10 )
and the **second protection device** ( 11, 12 )

as the **protection device** to be used when the
**fuel cell** ( 1 ) has stopped, and the **fuel**
**cell** ( 1 ) is **protected** from **freezing** of water
by operating the selected **protection device.**

L88 ANSWER 4 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:769237 CAPLUS
ED Entered STN: 02 Oct 2003
TI **Fuel cell** system and **protection** method
thereof
IN Ogawa, Soichiro
PA Nissan Motor Co., Ltd., Japan
SO PCT Int. Appl.
CODEN: PIXXD2
DT Patent
LA English
IC ICM H01M008-00
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | WO 2003081704 | A2 | 20031002 | WO 2003-JP2198 | 20030227 |
| | W: CN, KR, US | | | | |
| | RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR | | | | |
| | JP 2003288928 | A2 | 20031010 | JP 2002-88075 | 20020327 |
| PRAI | JP 2002-88075 | A | 20020327 | | |

AB A system has two modes which **protect** it from **freezing**
of water while a **fuel cell** stack (1) has stopped. An
effective **protection** mode from the viewpoint of energy
consumption is selected based on the estimated restart time and
**outside air temperature** shift, and used to
**protect** the system. The **protection** modes are: a
**first protection** mode which **prevents**
**freezing** by heating the water supplied to the **fuel**
**cell** (1), and a **second protection** mode which
avoids **freezing** of water in the **fuel cell**
(1) by discharging the water in the **fuel cell** (1) to
outside the **fuel cell** (1), and **freezing** the
water outside the **fuel cell** (1).

L88 ANSWER 5 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:634132 CAPLUS
DN 139:166968
ED Entered STN: 15 Aug 2003
TI Electrode current collectors for solid oxide **fuel cells**
IN Tao, Tao T.; Bai, Wei; Blake, Adam P.; Kwa, Jason K.; Wang, Gonghou
PA Celltech Power, Inc., USA
SO PCT Int. Appl., 92 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM H01M

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CC   52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
     Section cross-reference(s): 72, 79
FAN.CNT 1
     PATENT NO.         KIND  DATE           APPLICATION NO.   DATE
     ---------------    ----  --------       ---------------   --------
PI   WO 2003067683       A2   20030814       WO 2003-US3642    20030206
         W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
             CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
             GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
             LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH,
             PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA,
             UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
         RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG,
             CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC,
             NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
             ML, MR, NE, SN, TD, TG
PRAI US 2002-354715P     P    20020206
     US 2002-391626P     P    20020626
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AB Various aspects of the present invention relate to current collector arrangements and compns. in an electrochem. device. In an electrochem. device used to convert chemical energy via an electrochem. reaction into elec. energy, the elec. energy may be collected via a current collector of the present invention. The electrochem. device may be used anywhere that elec. energy is needed. Examples of electrochem. devices include a **fuel cell** and a **battery**; other examples include an oxygen purifier and an oxygen **sensor.** The current collector may include an elec. conducting core and an elec. connector. In certain embodiments, the elec. conducting core may be made out of a material able to withstand the operating conditions of the electrochem. apparatus, which may include, for example, a liquid anode or cathode, or a reducing or oxidizing environment; in other embodiments, the elec. conducting core may be surrounded and **protected** from the operating conditions by one or more materials. In some embodiments, addnl. materials may be used to facilitate elec. communication within the device. For example, an interconnect able to withstand the operating conditions may be used to connect two or more cells within the device.

ST electrode current collector solid oxide **fuel cell**

IT Thermal expansion
(coefficient; electrode current collectors for solid oxide **fuel cells**)

IT Felts
Wires
(current collector; electrode current collectors for solid oxide **fuel cells**)

IT Electric apparatus
(electrochem.; electrode current collectors for solid oxide **fuel cells**)

IT Coating materials
Erosion (wear)
**Fuel cell** electrodes
Gas **sensors**
Interconnections, electric

Secondary **batteries**
(electrode current collectors for solid oxide **fuel cells**)
IT Silicates, uses
RL: DEV (Device component use); USES (Uses)
(electrode current collectors for solid oxide **fuel cells**)
IT Noble metals
RL: MOA (Modifier or additive use); USES (Uses)
(electrode current collectors for solid oxide **fuel cells**)
IT Superalloys
RL: MOA (Modifier or additive use); USES (Uses)
(electrode current collectors for solid oxide **fuel cells**)
IT Carbonaceous materials (technological products)
RL: TEM (Technical or engineered material use); USES (Uses)
(fuel; electrode current collectors for solid oxide **fuel cells**)
IT Solid state **fuel cells**
(oxide; electrode current collectors for solid oxide **fuel cells**)
IT Ceramics
Cermets
(sheathing material; electrode current collectors for solid oxide **fuel cells**)
IT Borides
Carbides
Nitrides
Oxides (inorganic), uses
Rare earth metals, uses
RL: DEV (Device component use); USES (Uses)
(sheathing material; electrode current collectors for solid oxide **fuel cells**)
IT 7782-44-7P, Oxygen, preparation
RL: ANT (Analyte); PUR (Purification or recovery); ANST (Analytical study); PREP (Preparation)
(electrode current collectors for solid oxide **fuel cells**)
IT 630-08-0, Carbon monoxide, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(electrode current collectors for solid oxide **fuel cells**)
IT 1305-78-8, Calcium oxide, uses 1312-43-2, Indium oxide 1312-81-8, Lanthanum oxide 1314-11-0, Strontium oxide, uses 1332-29-2, Tin oxide 1332-37-2, Iron oxide, uses 1344-28-1, Aluminum oxide, uses 7439-88-5, Iridium, uses 11104-61-3, Cobalt oxide 11118-57-3, Chromium oxide 11129-18-3, Cerium oxide 11129-60-5, Manganese oxide 12064-62-9, Gadolinium oxide 12627-00-8, Niobium oxide 12651-06-8, Samarium oxide 13463-67-7, Titanium oxide, uses 37200-34-3, Scandium oxide 110584-66-2, Calcium chromium lanthanum oxide Ca0.2CrLa0.8O3

111569-09-6, Scandium zirconium oxide
RL: DEV (Device component use); USES (Uses)
(electrode current collectors for solid oxide **fuel**
**cells**)

IT 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-03-1, Niobium, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-15-5, Rhenium, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-22-4, Silver, uses 7440-25-7, Tantalum, uses 7440-28-0, Thallium, uses 7440-33-7, Tungsten, uses 7440-36-0, Antimony, uses 7440-38-2, Arsenic, uses 7440-44-0, Carbon, uses 7440-50-8, Copper, uses 7440-54-2, Gadolinium, uses 7440-56-4, Germanium, uses 7440-57-5, Gold, uses 7440-62-2, Vanadium, uses 7440-66-6, Zinc, uses 7440-69-9, Bismuth, uses 7723-14-0, Phosphorus, uses 7782-42-5, Graphite, uses 7782-49-2, Selenium, uses 12597-68-1, Stainless steel, uses 12597-69-2, Steel, uses 13494-80-9, Tellurium, uses
RL: MOA (Modifier or additive use); USES (Uses)
(electrode current collectors for solid oxide **fuel**
**cells**)

IT 1333-74-0, **Hydrogen**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(fuel; electrode current collectors for solid oxide **fuel**
**cells**)

IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7440-20-2, Scandium, uses 7440-24-6, Strontium, uses 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-39-3, Barium, uses 7440-41-7, Beryllium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-65-5, Yttrium, uses 7440-67-7, Zirconium, uses 7440-70-2, Calcium, uses 7440-74-6, Indium, uses 11116-16-8, Titanium nitride 11130-73-7, Tungsten carbide 12007-23-7, Hafnium boride 12069-94-2, Niobium carbide 12070-08-5, Titanium carbide 12070-14-3, Zirconium carbide (ZrC) 12653-77-9, Niobium boride 12653-85-9, Tantalum boride 12673-91-5, Titanium boride 12705-37-2, Chromium nitride 12741-10-5, Zirconium boride 24304-00-5, Aluminum nitride 51184-16-8, Cerium yttrium oxide 51680-51-4, Tantalum carbide 55072-50-9, Lanthanum strontium titanium oxide 55575-02-5, Cerium gadolinium oxide 55575-06-9, Cerium samarium oxide 57285-40-2, Chromium lanthanum strontium oxide 57679-28-4, Calcium chromium lanthanum oxide 58834-07-4, Cerium niobium oxide 59707-46-9, Lanthanum manganese strontium oxide 64417-98-7, Yttrium zirconium oxide 107992-37-0, Silicon carbide (Si0-1C0-1) 119173-61-4, Zirconium nitride 132084-94-7, Niobium strontium titanium oxide 137633-21-7, Iron lanthanum strontium oxide 154769-61-6, Carbon nitride
RL: DEV (Device component use); USES (Uses)
(sheathing material; electrode current collectors for solid oxide
**fuel cells**)

IT 1314-23-4, Zirconia, uses
RL: DEV (Device component use); USES (Uses)
(yttria-stabilized; electrode current collectors for solid oxide
**fuel cells**)

IT 1314-36-9, Yttria, uses
RL: DEV (Device component use); USES (Uses)

(zirconia stabilized with; electrode current collectors for solid oxide **fuel cells**)

L88 ANSWER 6 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:1007662 CAPLUS
DN 140:44732
ED Entered STN: 28 Dec 2003
TI **Protection device** for a **fuel cell** system
IN Konrad, Gerhard
PA DaimlerChrysler AG, Germany
SO U.S. Pat. Appl. Publ., 6 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM H01M008-04
NCL 429022000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 47
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | US 2003235729 | A1 | 20031225 | US 2003-456089 | 20030606 |
| | DE 10227754 | A1 | 20040115 | DE 2002-10227754 | 20020621 |
| PRAI | DE 2002-10227754 | A | 20020621 | | |

AB A **protection device** for a **fuel cell** system includes a gas **sensor** and an oxygen supply device. The **fuel cell** system includes a membrane module and a downstream **fuel cell.** The membrane module includes a **hydrogen**-selective membrane for separating **hydrogen** as a permeate **gas** from **hydrogen**-containing **reformate gas.** The downstream **fuel cell** includes an anode circuit for the permeate gas. The gas **sensor** monitors the oxygen content or the carbon dioxide content in the permeate gas. The oxygen supply device meters oxygen to the anode circuit as a function of an output **signal** of the gas **sensor.**
ST **fuel cell** system **protection device**
IT Membranes, nonbiological
(H-selective; **protection device** for **fuel cell** system)
IT Automobiles
**Fuel cells**
Gas **sensors**
(**protection device** for **fuel cell** system)
IT Hydrocarbons, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**protection device** for **fuel cell** system)
IT Fuel gas manufacturing
(**reforming**; **protection device** for

**fuel cell** system)
IT 7782-44-7, Oxygen, analysis
RL: ANT (Analyte); CPS (Chemical process); PEP (Physical, engineering or chemical process); ANST (Analytical study); PROC (Process)
(**protection device** for **fuel cell** system)
IT 124-38-9, Carbon dioxide, analysis
RL: ANT (Analyte); REM (Removal or disposal); ANST (Analytical study); PROC (Process)
(**protection device** for **fuel cell** system)
IT 1333-74-0P, **Hydrogen**, uses
RL: PUR (Purification or recovery); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**protection device** for **fuel cell** system)

L88 ANSWER 7 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:874851 CAPLUS
DN 139:340087
ED Entered STN: 07 Nov 2003
TI Active material for electrochemical cell anodes incorporating an additive for precharging/activation thereof
IN Ovshinsky, Stanford R.; Venkatesan, Srinivasan; Aladjov, Boyko; Wang, Hong; Vijan, Meera; Dhar, Subhash
PA USA
SO U.S. Pat. Appl. Publ., 9 pp., Cont.-in-part of U.S. Ser. No. 999,393.
CODEN: USXXCO
DT Patent
LA English
IC ICM H01M004-58
NCL 429231200; 252182100
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, 72
FAN.CNT 15

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | US 2003207175 | A1 | 20031106 | US 2003-436614 | 20030513 |
| | US 6447942 | B1 | 20020910 | US 2000-524116 | 20000313 |
| | US 2002064709 | A1 | 20020530 | US 2001-999393 | 20011031 |
| | US 6613471 | B2 | 20030902 | | |
| PRAI | US 2000-524116 | A2 | 20000313 | | |
| | US 2001-999393 | A2 | 20011031 | | |

AB The invention concerns a **hydrogen** storage alloy active material for the neg. electrode of an electrochem. cell. The active material includes a **hydrogen** storage alloy material with a water reactive chemical hydride additive, which, upon utilization of the active material in a neg. electrode of an electrochem. cell, gives the neg. electrode added benefits, not attainable by using **hydrogen** storage alloy material alone. These added benefits include (1) precharge of the **hydrogen** storage material with **hydrogen**; (2) higher porosity/increased surface area/reduced electrode polarization at high

currents; (3) simplified, faster activation of the **hydrogen**
storage alloy; and (4) optionally, enhanced corrosion **protection**
for the **hydrogen** storage alloy.

ST **battery** anode **hydrogen** storage alloy; **fuel**
**cell** anode **hydrogen** storage alloy

IT Secondary **batteries**
(Ni-metal hydride; active material for electrochem. cell anodes
incorporating additive for precharging/activation thereof)

IT **Battery** anodes
**Fuel cell** anodes
**Fuel cells**
(active material for electrochem. cell anodes incorporating additive
for precharging/activation thereof)

IT Rare earth alloys
RL: DEV (Device component use); USES (Uses)
(active material for electrochem. cell anodes incorporating additive
for precharging/activation thereof)

IT Alkali metal hydrides
RL: MOA (Modifier or additive use); USES (Uses)
(active material for electrochem. cell anodes incorporating additive
for precharging/activation thereof)

IT Hydrides
RL: MOA (Modifier or additive use); USES (Uses)
(active material for electrochem. cell anodes incorporating additive
for precharging/activation thereof)

IT Alloys, uses
RL: MOA (Modifier or additive use); USES (Uses)
(alkaline earth, hydrides and borohydrides; active material for
electrochem. cell anodes incorporating additive for
precharging/activation thereof)

IT Alloys, uses
RL: MOA (Modifier or additive use); USES (Uses)
(alkali metal, hydrides and borohydrides; active material for
electrochem. cell anodes incorporating additive for
precharging/activation thereof)

IT Alkali metals, uses
Alkaline earth metals
RL: MOA (Modifier or additive use); USES (Uses)
(alloys, hydrides and borohydrides; active material for electrochem.
cell anodes incorporating additive for precharging/activation thereof)

IT Alkaline earth compounds
RL: MOA (Modifier or additive use); USES (Uses)
(hydrides; active material for electrochem. cell anodes incorporating
additive for precharging/activation thereof)

IT Misch metal alloy, base
Titanium alloy, base
Zirconium alloy, base
RL: DEV (Device component use); USES (Uses)
(active material for electrochem. cell anodes incorporating additive
for precharging/activation thereof)

IT 11113-74-9, Nickel hydroxide 430471-01-5 476617-04-6
RL: DEV (Device component use); USES (Uses)

(active material for electrochem. cell anodes incorporating additive for precharging/activation thereof)
IT 7646-69-7, Sodium hydride 7693-26-7, Potassium hydride 13762-51-1, Potassium borohydride 16940-66-2, Sodium borohydride 16971-29-2, Borohydride 149319-34-6, Calcium nickel hydride 262437-80-9, Aluminum lithium hydride
RL: MOA (Modifier or additive use); USES (Uses)
(active material for electrochem. cell anodes incorporating additive for precharging/activation thereof)
IT 1333-74-0, **Hydrogen**, uses
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(active material for electrochem. cell anodes incorporating additive for precharging/activation thereof)

L88 ANSWER 8 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:77129 CAPLUS
DN 138:109625
ED Entered STN: 31 Jan 2003
TI Fuel **reforming** apparatus and method of starting it
IN Takimoto, Hidetoshi; Mizusawa, Minoru; Fukuchi, Yasuhiko; Kotani, Yasunori
PA Ishikawajima-Harima Heavy Industries Co., Ltd., Japan
SO U.S. Pat. Appl. Publ., 12 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM C01B003-32
NCL 048198700; 048198500; 422110000; 422111000; 422211000; 422198000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | US 2003019156 | A1 | 20030130 | US 2002-197862 | 20020719 |
| | JP 2003104706 | A2 | 20030409 | JP 2001-310874 | 20011009 |
| | EP 1281668 | A2 | 20030205 | EP 2002-16374 | 20020725 |
| | EP 1281668 | A3 | 20040204 | | |

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK

| | | | |
|---|---|---|---|
| PRAI | JP 2001-227472 | A | 20010727 |
| | JP 2001-310874 | A | 20011009 |

AB A combustion/**reforming** catalyst is composed of a plurality of catalyst layers arranged in series with **intervals** between them, and when a fuel **reforming** apparatus is started from a low temperature, while the supply of the fuel gas is stopped, air preheated in a preheater is supplied in parallel to a point upstream of each catalyst layer, thereby the catalyst in each catalyst layer is self-heated at the same time so that the entire catalyst is heated. After the whole catalyst is heated up to a temperature at which a combustion/**reforming** reaction can take place, the feed of air is temporarily stopped, the supply of fuel gas is started, next air is supplied while controlling the flow rate thereof so that temps. in the catalyst do not exceed the temperature that the

catalyst can withstand. Thus, no other special equipment or utilities are needed, and the apparatus can be started quickly (cold start), the **reforming** catalyst and the **fuel cell** can be **protected** from poisoning, and the apparatus can be made compact enough to install it in a elec. vehicle.

ST fuel **reforming** app starting

IT Electric vehicles
(automobiles; fuel **reforming** apparatus and method of starting it)

IT **Reforming** catalysts
(copper-zinc based; fuel **reforming** apparatus and method of starting it)

IT Automobiles
(elec.; fuel **reforming** apparatus and method of starting it)

IT **Fuel cells**
Fuel gases
(**fuel reforming** apparatus and method of starting it)

IT Synthesis gas manufacturing
(partial oxidation; fuel **reforming** apparatus and method of starting it)

IT Fuel gas manufacturing
(**reforming**; fuel **reforming** apparatus and method of starting it)

IT 7440-50-8, Copper, uses 7440-66-6, Zinc, uses
RL: CAT (Catalyst use); USES (Uses)
(fuel **reforming** apparatus and method of starting it)

IT 1333-74-0P, **Hydrogen**, preparation
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)
(fuel **reforming** apparatus and method of starting it)

L88 ANSWER 9 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:452292 CAPLUS
DN 139:15884
ED Entered STN: 13 Jun 2003
TI Circuit wire/contact structure for thin-film **heaters** and fabrication of structure thereof
IN Takeyama, Hiroyuki
PA Casio Computer Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 22 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01L021-3205
ICS C01B003-32; H01M008-04; H01M008-06; H01M008-10
CC 76-2 (Electric Phenomena)
Section cross-reference(s): 47, 52, 56, 57
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | JP 2003168685 | A2 | 20030613 | JP 2001-366519 | 20011130 |
| PRAI | JP 2001-366519 | | 20011130 | | |

AB The circuit wire/contacts provided on a thin-film **heater** and

underneath an **insulative protective** film over a
substrate is a refractory metal/Au/refractory metal multilayer. The
thin-film **heater** may be made of a metal nitride or oxide. The
lower refractory metal film in the multilayer gives the structure. The
**heater** may be applicable to micro-reactors and **fuel
cell batteries.** The multilayer circuit wire/contacts
give the Au-wire/contact low resistance and improved adhesion to the
**protective** film.

ST gold wire contact refractory metal lamination adhesion **protective**
film; contact thin film **heater** micro reactor **fuel
cell battery**

IT Electric contacts
(for thin film **heaters**; circuit wire/contact structure for
thin-film **heaters** and fabrication of laminated structure
thereof)

IT Nitrides
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(for thin film **heaters**; circuit wire/contact structure for
thin-film **heaters** and fabrication of laminated structure
thereof)

IT Refractory metals
RL: DEV (Device component use); PRP (Properties); TEM (Technical or
engineered material use); USES (Uses)
(laminated on gold contact, for improved adhesion; circuit wire/contact
structure for thin-film **heaters** and fabrication of laminated
structure thereof)

IT Oxides (inorganic), properties
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(metal, for thin film **heaters**; circuit wire/contact structure
for thin-film **heaters** and fabrication of laminated structure
thereof)

IT Reactors
(micro-, thin film **heater** for; circuit wire/contact structure
for thin-film **heaters** and fabrication of laminated structure
thereof)

IT **Fuel cells**
(thin film **heater** for; circuit wire/contact structure for
thin-film **heaters** and fabrication of laminated structure
thereof)

IT Electric **heaters**
(thin-film, for micro-reactors, circuit/contact for; circuit
wire/contact structure for thin-film **heaters** and fabrication
of laminated structure thereof)

IT Electric circuits
(wires for thin film **heater**; circuit wire/contact structure
for thin-film **heaters** and fabrication of laminated structure
thereof)

IT 7429-90-5, Aluminum, properties 7439-98-7, Molybdenum, properties
7440-25-7, Tantalum, properties 7440-32-6, Titanium, properties
7440-33-7, Tungsten, properties
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(adhesive layer laminated on gold circuit/contact; circuit wire/contact

```
        structure for thin-film heaters and fabrication of laminated
        structure thereof)
IT   7440-50-8, Copper, properties
     RL: DEV (Device component use); PRP (Properties); USES (Uses)
        (contact/circuit layer bound by refractory metal; circuit wire/contact
        structure for thin-film heaters and fabrication of laminated
        structure thereof)
IT   7440-57-5, Gold, properties
     RL: DEV (Device component use); PRP (Properties); USES (Uses)
        (elec. contact, laminated with refractory metal layers; circuit
        wire/contact structure for thin-film heaters and fabrication
        of laminated structure thereof)
IT   7440-21-3, Silicon, properties
     RL: DEV (Device component use); PRP (Properties); USES (Uses)
        (surface-oxidized micro-substrate; circuit wire/contact structure for
        thin-film heaters and fabrication of laminated structure
        thereof)
IT   7631-86-9, Silica, properties   12033-89-5, Silicon nitride (Si3N4),
     properties
     RL: DEV (Device component use); PRP (Properties); USES (Uses)
        (thin film heater; circuit wire/contact structure for
        thin-film heaters and fabrication of laminated structure
        thereof)

L88  ANSWER 10 OF 34  CAPLUS  COPYRIGHT 2004 ACS on STN
AN   2003:259847  CAPLUS
DN   138:257928
ED   Entered STN:  04 Apr 2003
TI   Fuel cell having an anode protected from
     high oxygen ion concentration
IN   Keegen, Kevin Richard; Fischer, Bernie; England, Diane M.
PA   Delphi Technologies, Inc., USA
SO   Eur. Pat. Appl., 11 pp.
     CODEN: EPXXDW
DT   Patent
LA   English
IC   ICM  H01M008-12
     ICS  H01M008-04
CC   52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1
     PATENT NO.        KIND  DATE          APPLICATION NO.  DATE
     ---------------   ----  --------      ---------------  --------
PI   EP 1298753         A2   20030402      EP 2002-78690    20020909
         R:  AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
             IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK
     US 2003064264      A1   20030403      US 2001-968419   20011001
     US 6709782         B2   20040323
PRAI US 2001-968419     A    20011001
AB   A fuel cell has an optimized flow space for the
     passage of hydrogen gas across the surface of an anode.  The
     invention prevents destructive oxidation of the anode by preventing the
     buildup of locally high levels of oxygen.  The anode surface itself may be
```

shaped in lateral plan to follow the natural contours of gas flow to eliminate **hydrogen** stagnation areas on the anode surface. Alternatively, the anode surface or the cathode surface may be coated in regions of anode stagnation to prevent the **fuel cell** reactions from occurring in those regions. Alternatively, the gas seals may be formed to cover the anode surface in stagnation regions. Alternatively, the cathode and/or electrolyte may be shaped or thickened to reduce or prevent diffusion of oxygen ions there-through.

ST **fuel cell** anode **protection** high **oxygen** ion **concn**

IT **Fuel cell** anodes
Oxidation
Solid state **fuel cells**
(**fuel cell** having anode **protected** from high **oxygen** ion **concentration**)

IT 7782-44-7, Oxygen, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**fuel cell** having anode **protected** from high **oxygen** ion **concentration**)

IT 1333-74-0, **Hydrogen**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**fuel cell** having anode **protected** from high **oxygen** ion **concentration**)

L88 ANSWER 11 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:219718 CAPLUS
DN 138:207865
ED Entered STN: 20 Mar 2003
TI **Fuel cell** system with drainage line for the removal of condensate from the storage tank
IN Sang, Jochen; Voehringer, Thomas
PA Ballard Power Systems AG, Germany
SO Ger. Offen., 4 pp.
CODEN: GWXXBX
DT Patent
LA German
IC ICM H01M008-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | DE 10141906 | A1 | 20030320 | DE 2001-10141906 | 20010828 |
| PRAI | DE 2001-10141906 | | 20010828 | | |

AB A **fuel cell** system is provided with at least a **fuel cell**, which contains an anode side and a cathode side, a gas production system for the production of **H2**-containing gas for the anode side, a supply line for O2-containing gas to the cathode side, and a supply line for the supply of pre-compressed, O2-containing gas to the gas production system, in which at least a compressor, and a storage facility are placed. A drainage line is guided from the storage facility and meets the area of the supply line to the cathode side. The drainage line is

suitable for the discharge of the condensate arising in the storage facility, whereby the gas generation system is **protected** for the inlet of liquid condensate for an improved operating of the **fuel cell.**

ST **fuel cell water** condensate removal **drainage** line

IT Pipes and Tubes
(drainage; **fuel cell** system with drainage line for the removal of condensate from the storage tank)

IT **Fuel cells**
(with drainage line for the removal of condensate from the storage tank)

IT 7732-18-5, Water, processes
RL: REM (Removal or disposal); PROC (Process)
(**fuel cell** system with drainage line for the removal of condensate from the storage tank)

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
(1) Anon; DE 19703728 A1
(2) Anon; DE 4318818 C2
(3) Anon; US 5200278 CAPLUS

L88 ANSWER 12 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:289371 CAPLUS
ED Entered STN: 15 Apr 2003
TI A viable niche market - **fuel cell** scooters in Taiwan
AU Tso, Chunto; Chang, Shih-Yun
CS Research Division I, Taiwan Institute of Economic Research (TIER) 7FI., Taipei, Taiwan
SO International Journal of Hydrogen Energy (2003), 28(7), 757-762
CODEN: IJHEDX; ISSN: 0360-3199
PB Elsevier Science Ltd.
DT Journal
LA English

AB Taiwan is a place marketed by intensive scooter use because of limited space and transportation habits. Because internal-combustion-engine scooters cause serious environmental pollution, the Environmental **Protection** Administration (EPA), Government of the Republic of China, executes policies-such as the strict exhaust standard, "Elec. Motorcycle Development Action plan"-and provides a subsidy for purchasing elec. scooters. The main objective of the EPA has been to encourage the use of elec. scooters and gradually weed out the highly polluting engine scooters. However, the policies have not worked well because of the poor performance of lead-acid or nickel-**hydrogen batteries** as well as the lack of recharge stations. Therefore, consumers have not been willing to purchase elec. scooters. To overcome the problems of **battery** powered elec. scooters, producers have been working to apply **fuel cell** technol. This paper will discuss the current situation of **battery** powered elec. scooters under the Taiwan government's supports, as well as the expected development of **fuel cell** scooters in view of com. aspects, such as economics, consumer demand, niche markets and government intervention.In

order to integrate the development of **fuel cell**
technol. with the capabilities of industry, government, and academic
research, the Taiwan Institute of Economic Research (TIER) is organizing
the Taiwan **Fuel Cell** Partnership (TFCP). Among the
projects of the TFCP, promoting **fuel cell** scooters is
the most important in the beginning phase. Furthermore, in alliance with
assocs., TIER is planning to hold a demonstration program of **fuel**
**cell** scooters on Green Island, an islet close to Taiwan.
Hopefully, **fuel cell** scooters will be commercialized
in 2004.Taiwan is one of the world's major producers of engine scooters.
There are over 18 million scooters sold in Asia every year. Taiwan is now
making an effort to apply new technol. for developing **fuel**
**cell** scooters. In addition to eliminating the pollutants made by
engine scooters in Taiwan, the **fuel cell** scooters
should be promoted to the huge scooter market in Asia.

RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
(1) Anon; Conference Proceedings, Taiwan Institute of Economic Research (TIER) 1999
(2) Asia pacific fuel cell technologies Ltd; (APFCT) Introduction 2002
(3) Chang, S; Taiwan Economic Research Monthly 2000
(4) Colella, W; J Power Sources 2000, V86, P255 CAPLUS
(5) Environmental Protection Administration (EPA); Electric motorcycle development action plan 1998
(6) James, H; Power Sources 2000, V86, P151
(7) Lin, B; Journal of Power Sources 2000, V86, P202 CAPLUS
(8) Tso, C; Characteristics and application of fuel cells 2001
(9) Tso, C; Proceedings of Fuel Cell 2001 Seminar 2001
(10) Yang, J; PEM fuel cell power for electric scooters 1999
(11) Yang, J; Proceedings of Fuel Cell 2000 Seminar 2000

L88 ANSWER 13 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:148537 CAPLUS
DN 139:135948
ED Entered STN: 27 Feb 2003
TI Technical assessment of **fuel cell** operation on
landfill gas at the Groton, CT, landfill
AU Spiegel, R. J.; Preston, J. L.
CS US Environmental Protection Agency (EPA), National Risk Management
Research Laboratory, Research Triangle Park, NC, 27711, USA
SO Energy (Oxford, United Kingdom) (2003), 28(5), 397-409
CODEN: ENEYDS; ISSN: 0360-5442
PB Elsevier Science Ltd.
DT Journal
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
AB This paper summarizes the results of a seminal assessment conducted on a
**fuel cell** technol. that generates elec. power from
landfill waste gas. This assessment at Groton, Connecticut was the second
such project conducted by the Environmental **Protection** Agency,
the **first** being conducted at the Penrose Power Station near Los
Angeles, California. The main objective was to demonstrate the

suitability of the landfill gas energy conversion equipment at Groton with different conditions and gas compns. than at Penrose. The operation of the landfill gas cleanup system removed contaminants from the gas stream with essentially the same efficacy as at Penrose, even though the quantity and kinds of contaminants were somewhat different. The maximum output power of **fuel cell** power plant improved from 137 kW at
Penrose to 165 kW at Groton, due to a 31% increase in the heating value of the Groton landfill gas.

ST **fuel cell** operation landfill gas

IT Waste gases
(landfill; tech. assessment of **fuel cell** operation on landfill gas)

IT **Fuel cells**
(power plants; tech. assessment of **fuel cell** operation on landfill gas)

IT **Fuel cells**
(tech. assessment of **fuel cell** operation on landfill gas)

IT 56-23-5, Carbon tetrachloride, analysis 67-66-3, Chloroform, analysis 74-83-9, Bromomethane, analysis 74-87-3, Chloromethane, analysis 75-00-3, Chloroethane 75-09-2, Methylene chloride, analysis 75-25-2, Bromoform 75-35-4, 1,1-Dichloroethene, analysis 75-69-4, Trichlorofluoromethane 75-71-8, Dichlorodifluoromethane 79-01-6, Trichloroethylene, analysis 107-06-2, 1,2-Dichloroethane, analysis 108-86-1, Bromobenzene, analysis 156-60-5, trans-1,2-Dichloroethylene 10061-01-5, cis-1,3-Dichloropropylene 26523-64-8, Trichlorotrifluoroethane
RL: ANT (Analyte); OCU (Occurrence, unclassified); ANST (Analytical study); OCCU (Occurrence)
(landfill gas containing; tech. assessment of **fuel cell** operation on landfill gas)

IT 71-55-6, 1,1,1-Trichloroethane 75-01-4, Vinyl chloride, analysis 75-34-3, 1,1-Dichloroethane 108-90-7, Chlorobenzene, analysis 127-18-4, Tetrachloroethylene, analysis 156-59-2, cis-1,2-Dichloroethylene
RL: ANT (Analyte); OCU (Occurrence, unclassified); REM (Removal or disposal); ANST (Analytical study); OCCU (Occurrence); PROC (Process)
(landfill gas containing; tech. assessment of **fuel cell** operation on landfill gas)

IT 71-43-2, Benzene, processes 74-93-1, Methyl mercaptan, processes 75-08-1, Ethyl mercaptan 75-15-0, Carbon disulfide, processes 75-18-3, Dimethyl sulfide 100-41-4, Ethylbenzene, processes 100-42-5, Styrene, processes 108-88-3, Toluene, processes 463-58-1, Carbonyl sulfide 624-92-0, Dimethyl disulfide 1330-20-7, Xylene, processes 7783-06-4, **Hydrogen** sulfide, processes
RL: REM (Removal or disposal); PROC (Process)
(landfill gas containing; tech. assessment of **fuel cell** operation on landfill gas)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Graham, J; Chem Eng 1993, V100(2 Suppl), P6
(2) Preston, J; Testing of fuel cells to recover energy from landfill gas:

groton landfill 1998, EPA-600/R-98-126, NTIS PB 99-105199
(3) Spiegel, R; Energy 1997, V22(8), P777 CAPLUS
(4) Spiegel, R; Energy 1999, V24, P723 CAPLUS
(5) Spiegel, R; J Power Sources 2000, V86, P283 CAPLUS

L88 ANSWER 14 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:677158 CAPLUS
DN 139:367316
ED Entered STN: 29 Aug 2003
TI Ion conducting ceramic electrolytes: A century of progress
AU Gordon, Ronald S.
CS School of Ceramic Engineering and Materials Science, New York State College of Ceramics at Alfred University, Alfred, NY, 14802, USA
SO Proceedings - Electrochemical Society (2003), 2003-7(Solid Oxide Fuel Cells VIII (SOFC VIII)), 141-152
CODEN: PESODO; ISSN: 0161-6374
PB Electrochemical Society
DT Journal; General Review
LA English
CC 52-0 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57, 76
AB A review. The evolution of Na, O and H ion-conducting ceramic electrolytes is discussed with emphasis on O-ion conductors. These materials, such as the stabilized zirconias, are critical to the com. success of O **sensors**, the solid oxide **fuel cell** (SOFC) and devices separating O from air. They can also serve as **protective** coatings for other O ion conductors and in the synthesis of Na-ion conducting ceramic composites. An assessment of mixed ionic/electronic conducting oxides employed in O separation devices is made. The partial oxidation of methane and the development of composite anode and cathode structures in SOFCs are also presented. The development of rechargeable beta **batteries** for elec. vehicles and load leveling energy storage systems employing Na-ion conducting $\beta$''-Al2O3 electrolytes will be placed into perspective with the evolution of SOFC power generation systems.
ST review ceramic electrolyte oxygen ion conductor **sensor** **fuel cell**
IT Electric conductors, ceramic
**Fuel cell** electrolytes
Ionic conductors
Solid electrolytes
(review of ion-conducting ceramic electrolytes)
RE.CNT 38 THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Bhide, S; J Electrochem Soc 1999, V146, P2038 CAPLUS
(2) Coetzer, J; J Power Sources 1987, V18, P377
(3) Etsell, T; Chem Rev 1970, V70, P339 CAPLUS
(4) Fung, K; J Am Ceram Soc 1991, V74, P1970 CAPLUS
(5) Goodenough, J; Proceedings of Fuel Cells '97 Review Meeting 1997, Paper 5.5
(6) Gordon, R; Ceramic Transactions 1996, V68, P203
(7) Iwahara, H; J Electrochem Soc 1988, V135, P529 CAPLUS
(8) Iwahara, H; Solid State Ionics 1983, V11, P109 CAPLUS

(9) Khandkar, A; Ceramic Transactions 1996, V65, P263 CAPLUS
(10) Kilner, J; Solid State Ionics 1982, V6, P237 CAPLUS
(11) Kim, J; J Electrochem Soc 1999, V146, P69 CAPLUS
(12) Kingery, W; J Am Ceram Soc 1959, V42, P393 CAPLUS
(13) Kiukkola, K; J Electrochem Soc 1957, V104, P308 CAPLUS
(14) Kummer, J; Progress in Solid State Chemistry 1972, V7, P141 CAPLUS
(15) Kummer, J; Soc Automotive Eng Trans 1968, V76, P1003
(16) Liang, K; Solid State Ionics 1993, V61, P77 CAPLUS
(17) Liang, K; Solid State Ionics 1994, V69, P117 CAPLUS
(18) Minh, N; J Am Ceram Soc 1993, V76, P563 CAPLUS
(19) Minh, N; Science and Technology of Fuel Cells 1995
(20) Nernst, W; Z Elektrochem 1900, V6, P41
(21) Patterson, J; J Electrochem Soc 1967, V114, P752 CAPLUS
(22) Ramanarayanan, T; Electrochem Soc Interface 2001, P22 CAPLUS
(23) Rankin, G; J Am Chem Soc 1916, V38, P568 CAPLUS
(24) Rhodes, W; J Am Ceram Soc 1966, V49, P244 CAPLUS
(25) Rohr, F; Solid Electrolytes 1978, P431 CAPLUS
(26) Singhal, S; Solid State Ionics 2000, V135, P305 CAPLUS
(27) Smith, A; J Am Ceram Soc 1966, V49, P240 CAPLUS
(28) Sudworth, J; The Sodium Sulfur Battery 1985
(29) Takahashi, T; J Appl Electrochem 1975, V5, P187 CAPLUS
(30) Virkar, A; Electrochemical Society Proceedings 2002, VPV 2002-5, P200
(31) Virkar, A; J Electrochem Soc 1991, V138, P1481 CAPLUS
(32) Wagner, C; Naturwiss 1943, P263
(33) Weber, N; Energy Conversion 1974, V14, P1 CAPLUS
(34) Weissbart, J; J Electrochem Soc 1962, V109, P723 CAPLUS
(35) Weissbart, J; Rev Sci Instr 1961, V32, P593 CAPLUS
(36) Worrell, W; Am Ceram Soc Bull 1974, V53, P425 CAPLUS
(37) Yahiro, H; J Electrochem Soc 1988, V135, P2077 CAPLUS
(38) Zhao, Z; Proceedings of the Seventh International Symposium on Solid Oxide Fuel Cells (SOFC VII) 2001, P501

L88 ANSWER 15 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:590281 CAPLUS
DN 137:143038
ED Entered STN: 08 Aug 2002
TI Carbon monoxide detection and purification system for **fuel cells**
IN Goldstein, Mark K.; Ryu, Jaeseok; Schrauzer, Gerhard N.; Scripca, Lucian
PA Quantum Group, Inc., USA
SO U.S., 20 pp.
CODEN: USXXAM
DT Patent
LA English
IC ICM G01N033-00
NCL 436134000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | US 6429019 | B1 | 20020806 | US 2000-487512 | 20000119 |

PRAI US 1999-116323P P 19990119

AB The invention provides an apparatus and method for determining the concentration of CO
**gas** in a fuel **reformate** stream such as in a proton-exchange membrane (PEM) **fuel cell** vehicle. This invention **protects** the **fuel cell** catalyst by controlling the **reformate** stream system to minimize the CO and reduce it by a novel catalyst system that selectively converts CO to methane but does not react with carbon dioxide and **hydrogen**. The catalyst may reduce the CO to methane by reaction with **hydrogen.** The preferred embodiment both monitors the CO by a thermal differential sensing means and an optical biomimetic **sensor** and or a conductivity **sensor.** These **sensors** respond to the CO gas and are monitored by one or more monitoring **sensors** such as the temperature and or conductivity difference between the control and the catalytic material such as nickel and in the biomimetic **sensor** an optical change is monitored. The optical sensing comprising a photon source optically coupled to the **sensor** and photodiode system, so that the photon flux is a function of at least one other **sensor**'s response to the CO gas, e.g., transmits light through the **sensor** to the photodiode. The photocurrent from the photodiode is converted to a digital **sensor** reading value proportional to the optical characteristic(s) of the **sensor**(s) as a function of time and the data is loaded into a microprocessor or other logic circuit. In the microprocessor, the **sensor** readings are essentially used to calculate the CO concentration and control the process to maximize the **fuel cell** or to trigger a **signal** for service.

ST **fuel cell** carbon monoxide detection purifn system

IT **Sensors**
(biomimetic; carbon monoxide detection and purification system for **fuel cells**)

IT **Fuel cells**
Fuels
Gas **sensors**
Optical detectors
Photodiodes
Reduction catalysts
(carbon monoxide detection and purification system for **fuel cells**)

IT Bromides, uses
Chlorides, uses
RL: DEV (Device component use); USES (Uses)
(carbon monoxide detection and purification system for **fuel cells**)

IT Molybdates
RL: DEV (Device component use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(heteropolymolybdates; carbon monoxide detection and purification system for **fuel cells**)

IT Heteropoly acids

RL: DEV (Device component use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(molybdates; carbon monoxide detection and purification system for **fuel cells**)

IT 630-08-0, Carbon monoxide, analysis
RL: ANT (Analyte); POL (Pollutant); ANST (Analytical study); OCCU (Occurrence)
(carbon monoxide detection and purification system for **fuel cells**)

IT 7440-02-0, Nickel, uses
RL: CAT (Catalyst use); USES (Uses)
(carbon monoxide detection and purification system for **fuel cells**)

IT 74-82-8, Methane, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(carbon monoxide detection and purification system for **fuel cells**)

IT 7439-98-7, Molybdenum, uses 7440-05-3, Palladium, uses 7440-50-8, Copper, uses 7440-70-2, Calcium, uses 12619-70-4, Cyclodextrin
RL: DEV (Device component use); USES (Uses)
(carbon monoxide detection and purification system for **fuel cells**)

IT 1344-67-8, Copper chloride 7440-05-3D, Palladium, salts 7440-50-8D, Copper, salts 7585-39-9, β-Cyclodextrin 7647-10-1, Palladium chloride 7758-98-7, Copper sulfate, uses 10016-20-3, α-Cyclodextrin 11098-84-3, Ammonium molybdate 11104-89-5, Silicomolybdic acid 11129-27-4, Copper bromide 12619-70-4D, Cyclodextrin, hydroxymethyl Et and Pr derivs. 13444-94-5, Palladium bromide 13566-03-5, Palladium sulfate 17465-86-0, γ-Cyclodextrin 40974-00-3, Copper perchlorate
RL: DEV (Device component use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(carbon monoxide detection and purification system for **fuel cells**)

IT 1333-74-0P, **Hydrogen**, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(carbon monoxide detection and purification system for **fuel cells**)

IT 7631-86-9, Silica, uses
RL: DEV (Device component use); USES (Uses)
(substrate; carbon monoxide detection and purification system for **fuel cells**)

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
(1) Bao; US 5985673 A 1999 CAPLUS
(2) Chen; US 5662737 A 1997 CAPLUS
(3) Eicker; US 4012692 A 1977
(4) Fujishita; US 5388405 A 1995
(5) Goldstein; US 5063164 A 1991 CAPLUS
(6) Goldstein; US 5280273 A 1994
(7) Goldstein; US 5618493 A 1997 CAPLUS

(8) Goldstein; US 5793295 A 1998 CAPLUS
(9) Goswami; US 5302350 A 1994 CAPLUS
(10) Goswami; US 5346671 A 1994 CAPLUS
(11) Goswami; US 5405583 A 1995 CAPLUS
(12) Marnie; US 5573953 A 1996 CAPLUS
(13) Marnie; US 5624848 A 1997 CAPLUS
(14) Poli; US 4030887 A 1977 CAPLUS
(15) Rehg; US 6245214 B1 2001 CAPLUS
(16) Shuler; US 4043934 A 1977 CAPLUS

L88 ANSWER 16 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:955748 CAPLUS
ED Entered STN: 18 Dec 2002
TI Electromotive vehicle. [Machine Translation].
IN Mizuno, Hiroshi; Saito, Mikio; Kuranishi, Masahisa
PA Yamaha Motor Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 15 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM B62M023-02
ICS B62J009-00; B62J039-00; H01M008-00; H01M008-04
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | JP 2002362470 | A2 | 20021218 | JP 2001-178046 | 20010613 |
| PRAI | JP 2001-178046 | | 20010613 | | |

AB [Machine Translation of Descriptors]. As **protection** of the part from heat generation is done, it cools inside the casing which is received to the compact, it **insulates**, and it **heats** appropriately improving of generation of electricity efficiency and shortening in starting time of **fuel cell** are possible. As it loads **fuel cell** unit 30, the driving wheel being the electromotive vehicle which has drive possible electric motor 21 by the electric power which is supplied from this **fuel cell** unit 30, charge possibility hugely the supply possible secondary **battery** 301 which control the output of **fuel cell cell** stack 302 receiving to casing 300, it forms electric power in electric motor 21 with **fuel cell** -304 and due to the generation of electricity of **fuel cell cell** stack, 302 **fuel cell cell** stack covers 302 and or fuel **heater** 321 with **heat insulator**, 306,326 at the same time, it provides the vehicle running direction travelling wind inlet 330 of casing 300 anteriorly, on the vehicle running direction back travelling The wind outlet 331 is provided.

L88 ANSWER 17 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:155295 CAPLUS
ED Entered STN: 28 Feb 2002
TI **Fuel cell** system and **fuel cell** operational method. [Machine Translation].

IN   Tani,   Toshihiro; Hisadome,   Takeo; Fukumoto,   Ryutaro
PA   Mitsubishi Heavy Industries, Ltd., Japan
SO   Jpn. Kokai Tokkyo Koho, 7 pp.
     CODEN: JKXXAF
DT   Patent
LA   Japanese
IC   ICM  H01M008-04
     ICS  H01M008-04
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | JP 2002063925 | A2 | 20020228 | JP 2000-251155 | 20000822 |
| PRAI | JP 2000-251155 | | 20000822 | | |

AB   [Machine Translation of Descriptors]. Preventing the fact that high tension is required for the equipment of direct current system when starting the **fuel cell**, **protects** the equipment. Equipment 8 A, 8 B and cuts off the supply of electric power of the **fuel cell** in order for electric power of proper voltage in the rated operation point to be supplied to the equipment the breaker of the voltage supervisory section on the basis 12 which detects the voltage of 4 which are connected to **fuel cell** 2 and the **fuel cell** and the detection voltage information, way the voltage stabilization **device** voltage of 20 which **protects** the equipment and the **fuel cell** while falling, early electric power from the **fuel cell** does not flow to the equipment from open circuit voltage to the rated operation point territory of the simulated load on the basis 31 which early electric power of the **fuel cell** the spending is done and the detection voltage information, in the breaker the closed directive **signal** As send, early electric power from the **fuel cell** being simulated load on the basis of the detection voltage information, in order to be consumed, the load dispatching instruction **signal** is sent to the voltage stabilization device, furthermore voltage of the **fuel cell** is the place where fell to the rated operation point and possesses with the control section 10 which sends the opening directive **signal** to the breaker.

L88  ANSWER 18 OF 34  WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN   2002-354277 [39]   WPIX
DNN  N2002-278403
TI   **Freezing protection** for electro-chemical battery ( **fuel cell**) with proton exchange membrane, has electrical resistance heater fed from fuel cell, separate batteries and electrical network.
DC   X16
IN   GERARD, D; ROUVEYRE, L
PA   (RENA) REGIE NAT USINES RENAULT
CYC  1
PI   FR 2813994      A1 20020315 (200239)*      16    H01M008-04
ADT  FR 2813994 A1 FR 2000-11724 20000914
PRAI FR 2000-11724         20000914

IC ICM H01M008-04
AB FR 2813994 A UPAB: 20020621
NOVELTY - The battery is fitted with a cooling circuit (2) having a circulation pump (10) and a heat exchanger (40). The cooling circuit includes a heater (14) **controlled** by a **temperature** sensor (17) which switches on the heater when the temperature is close to the cooling circuits distilled water freezing temperature. The heater includes an electrical resistance (15) mounted in the cooling circuit, the supply to it is from batteries (16), electrical network and fuel cell itself.

DETAILED DESCRIPTION - n an alternative version the heating resistance is also fed from the electro-chemical battery (fuel cell), which has an auxiliary circuit , fed with hydrogen and air, tapped from the principal supply circuit so as to operate the battery (1) at a lower power than normal operating power. The auxiliary circuit has a calibrated passage designed to supply sufficient hydrogen to generate the current necessary to supply the heating resistance. A fan (20) is included in the air part of the auxiliary circuit.

USE - For protection against freezing of batteries distilled water cooling fluid.

ADVANTAGE - Designed to protect the battery cooling fluid from freezing, when the battery is non operational, in a simple way, whilst proving efficient cooling when battery is operational.

DESCRIPTION OF DRAWING(S) - The drawing shows a schematic of one of two versions of the batteries circuits
fuel cell 1
cooling circuit 2
principal cooling circuit 3
heat exchanger 4
membranes 5
pump 10,12
radiator 13
heater 14
heating resistance 15
batteries 16
sensor 17
Dwg.1/2

FS EPI
FA AB; GI
MC EPI: X16-C01C; X16-C09; X16-K

L88 ANSWER 19 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2001:378284 CAPLUS
DN 135:123283
ED Entered STN: 25 May 2001
TI Effect of crown ethers on the conduction of plasticized polyacrylonitrile-based electrolytes
AU Yarmolenko, O. V.; Belov, D. G.; Efimov, O. N.
CS Institute of Problems of Chemical Physics, Russian Academy of Sciences, Moscow, 142432, Russia
SO Russian Journal of Electrochemistry (Translation of Elektrokhimiya) (2001), 37(3), 280-286

CODEN: RJELE3; ISSN: 1023-1935
PB MAIK Nauka/Interperiodica Publishing
DT Journal
LA English
CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 72
AB A series of new plasticized electrolytes based on a lithium salt, polyacrylonitrile, propylene carbonate, and such crown ethers as 15-crown-5 and benzo-15-crown-5 as additives is synthesized and studied. According to impedance spectroscopy, the electrolytes' conductivity is 6 + 10-3 S cm-1 at room temperature The electrolytes' compatibility with a new thin-film material (polyacetylene-covered **porous** polypropylene, which is used for **protecting** lithium anodes) is investigated.
ST polyacrylonitrile crown ether propylene carbonate lithium electrolyte cond; compatibility polyacrylonitrile lithium electrolyte polyacetylene coated polypropylene separator electrode
IT Electric impedance
Ionic conductivity
Polymer electrolytes
(effect of crown ethers on the conduction of plasticized polyacrylonitrile-based electrolytes)
IT Crown ethers
RL: MOA (Modifier or additive use); USES (Uses)
(effect of crown ethers on the conduction of plasticized polyacrylonitrile-based electrolytes)
IT Polyacetylenes, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polyacetylene-coated nonwoven polypropylene **battery** separator; effect of crown ethers on the conduction of plasticized polyacrylonitrile-based electrolytes)
IT **Fuel cell** separators
(polyacetylene-coated nonwoven polypropylene; effect of crown ethers on the conduction of plasticized polyacrylonitrile-based electrolytes)
IT 108-32-7, Propylene carbonate 14098-44-3, benzo-15-crown-5 33100-27-5, 15-crown-5
RL: MOA (Modifier or additive use); USES (Uses)
(effect of crown ethers on the conduction of plasticized polyacrylonitrile-based electrolytes)
IT 7791-03-9, Lithium perchlorate
RL: NUU (Other use, unclassified); USES (Uses)
(effect of crown ethers on the conduction of plasticized polyacrylonitrile-based electrolytes)
IT 7439-93-2D, Lithium, complexes with plasticized polyacrylonitrile, properties 25014-41-9D, Polyacrylonitrile, Li complexes
RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
(effect of crown ethers on the conduction of plasticized polyacrylonitrile-based electrolytes)
IT 7439-93-2, Lithium, uses
RL: DEV (Device component use); USES (Uses)
(electrode; effect of crown ethers on the conduction of plasticized polyacrylonitrile-based electrolytes)
IT 9003-07-0, Polypropylene 25067-58-7, Polyacetylene

RL: TEM (Technical or engineered material use); USES (Uses)
(polyacetylene-coated nonwoven polypropylene **battery** separator; effect of crown ethers on the conduction of plasticized polyacrylonitrile-based electrolytes)

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Abraham, K; J Electrochem Soc 1990, V137, P1657 CAPLUS
(2) Alamgir, M; J Power Sources 1995, V54, P40 CAPLUS
(3) Belov, D; Electrical and Optical Polymer Systems: Fundamentals, Methods, and Applications 1998, P297 CAPLUS
(4) Efimov, O; Synth Met 1996, V79, P193 CAPLUS
(5) Gladyshev, G; Stabilizatsiya termostoikikh polimerov (Stabilizing Thermostable Polymers) 1979
(6) Ito, T; J Polym Sci, Polym Chem Ed 1974, V12, P11 CAPLUS
(7) Tkachenko, L; Elektrokhimiya 1992, V28, P1818 CAPLUS
(8) Ukshe, E; Tverdye elektrolity (The Solid Electrolytes) 1977
(9) Yarmolenko, O; Elektrokhimiya 1996, V32, P520
(10) Zhu, Z; J Electrochem Soc 1993, V140, P101

L88 ANSWER 20 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2001:682456 CAPLUS
DN 135:259767
ED Entered STN: 19 Sep 2001
TI Technical performance and cost-relevant parameters of stationary SOFC- and PEMFC-systems in households and hotels
AU Konig, Sabine
CS Forschungszentrum Julich GmbH Programmgruppe Systemforschung and Technologische Entwicklung (STE), Germany
SO Schriften des Forschungszentrums Juelich, Reihe Energietechnik/Energy Technology (2001), 16, i-xvi, 1-193
CODEN: SFJTF2; ISSN: 1433-5522
PB Forschungszentrum Juelich GmbH
DT Journal
LA German
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
AB The present study deals with tech. and economical targets of SOFC and PEMFC-systems in cogeneration systems supplying different types of households and hotels. An addnl. gas-fired boiler for peak load applications and the connection to the public grid are included into the supply system. The elec. capacity of the **fuel cells** vary depending on the operation mode (heat- or electricity-conducted). The thermal and elec. efficiency are modelled according to the different partial load characteristics of SOFC- and PEMFC-systems. The supply objects are one- and multi-family dwellings as well as two hotels (400 and 50 rooms). As thermal **insulation** standard the **Heat Protection** Ordinance of 1989 and its improved standard of 1995 are chosen. Electricity and heat demand are modelled with different load characteristics in **intervals** of 15 min (electricity) and one hour (heat). In order to evaluate economical and environmental features of the energy supply system, the **fuel cell** systems are compared with two conventional gas-fired systems: the combination of a boiler and the public grid and a cogeneration system. Greenhouse gas

emissions are exergetically calculated for each supply case. Economical targets are specified by the calcn. of allowed investment costs, regarding the maximum possible greenhouse gas reduction at the same time.

ST economics polymeric membrane **fuel cell** power generation; SOFC household hotel power generation economics

IT **Fuel cells**
(polymeric membrane; tech. performance and cost-relevant parameters of stationary SOFC- and polymeric membrane **fuel cell** systems in households and hotels)

IT **Fuel cells**
(power plants; tech. performance and cost-relevant parameters of stationary SOFC- and polymeric membrane **fuel cell** systems in households and hotels)

IT Economics
Solid state **fuel cells**
(tech. performance and cost-relevant parameters of stationary SOFC- and polymeric membrane **fuel cell** systems in households and hotels)

RE.CNT 82 THERE ARE 82 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Alefeld, G; Brennstoff-Warme-Kraft (BWK) 1988, V40(3), P72 CAPLUS
(2) Anon; Bundesgesetzblatt Jahrgang 2000, Teil I 2000, 22
(3) Anon; Bundesgesetzblatt Jahrgang 2000; Teil I 2000, 13
(4) Anon; Das IKARUS-Projekt: Klimaschutz in Deutschland. Strategien fur 2000-2020 1999
(5) Anon; Politikszenarien fur den Klimaschutz: Szenarien und Massnahmen zur Minderung von CO2-Emissionen in Deutschland V1
(6) Anon; Produkt-Informationen verschiedener BHKW-Lieferanten 1999
(7) Anon; Reihe Umwelt 1997, V6
(8) Anon; Solid OxideFuelCell. Technical Data 1999
(9) Anon; Statistisches Bundesamt 1998 1998
(10) Appleby, A; Fuel Cell Handbook; 2. Auflage 1993, P17
(11) Arbeitsgemeinschaft fur sparsamen und umweltfreundlichen Energieverbrauch (ASUE); BHKW-Kenndaten 1994
(12) BINE Projekt Info-Service; Brennstoffzellen - Kraftwerke der Zukunft ? 1992
(13) BUDERUS; Handbuch fur Heizungstechnik, 5. Auflage 1998
(14) Baehr, H; Brennstoff-Warme-Kraft (BWK) 1988, V40(11), P450 CAPLUS
(15) Barp, B; Kraft-Warme-Kopplung fur die Gebaudetechnik mit SOFC-Brennstoffzellen 1995, VDI Berichte Nr 1174, P173
(16) Bauer, B; Brennstoff-Warme-Kraft (BWK) 1990, V42(11), P664 CAPLUS
(17) Belting, T; Brennstoff-Warme-Kraft (BWK) 1984, V36(11), P457
(18) Berliner Kraft- und Licht (BEWAG)-Aktiengesellschaft; Energieverbrauch 1996. Haushaltskundenbefragung 1997
(19) Berliner Kraft- und Licht (BEWAG)-Aktiengesellschaft; Messdaten von Sonderkunden 1996 1996
(20) Diethelm, R; Gas Wasser Abwasser (gwa) 1997, V77(2), P104 CAPLUS
(21) Diethelm, R; Status of the Sulzer Hexis Solid Oxide Fuel Cell System Development 1998
(22) Drake, F; Kumulierte Treibhausgasemissionen zukunftiger Energiesysteme; 1. Auflage 1996
(23) Drenckhahn, W; Anlagenkonzeption und Wirtschaftlichkeit von

SOFC-Kraftwerken 1998
(24) Drenckhahn, W; Energiewirtschaftliche Tagesfragen 1993, V43(6), P382
(25) Drenckhahn, W; Wasserstofftechnik IV 1995, P143 CAPLUS
(26) Duwall, P; Abschlussbericht zum BMFT/BMWi Forschungsauftrag 1986
(27) Duwall, P; Elektrizitatswirtschaft 1983, V82(20), P751
(28) EWU Engineering GmbH; Kennziffernkatalog Investitionsvorbereitung in der Energiewirtschaft 1999, P128
(29) Eduard Pestel Institut fur Systemforschung eV; Vergleich der Stromund Heizenergieerzeugung in gekoppelten und ungekoppelten Anlagen vor dem Hintergrund der Einsparmoglichkeiten durch Warmedammung. Teil 1: Systemvergleich und allgemeine Ergebnisse 1994, P26
(30) Elsner, N; Brennstoff-Warme-Kraft (BWK) 1993, V45(7/8), P353 CAPLUS
(31) Energieagentur, N; Energieverbrauche von Hotelbetrieben 1995-1996
(32) Energiewirtschaft und Technik Verlagsgesellschaft mbH; RWE Energie: strom, Ausgabe 4/1999 P2
(33) Erdmann, G; Energieokonomik; 2. Auflage 1995
(34) Erdmann, G; Heizung Luftung Haustechnik (HLH) 1998, V49(11), P24
(35) Fachinformationszentrum Karlsruhe; IKARUS-Datenbank Version 2.0 1999
(36) Forschungsstelle fur Energiewirtschaft; Perspektiven einer Wasserstoffwirtschaft (Teil 2); wiba (Koordinationsstelle der Wasserstoff-Initiative Bayern) 1999
(37) Forschungszentrum Julich GmbH; Programmgruppe Technologiefolgenforschung 1996, P1
(38) Forschungszentrum Julich GmbH; Reihe Umwelt 1997, V6
(39) Forschungszentrum Julich GmbH; Reihe Umwelt 1998, V8, P50
(40) Friedrichs, G; Gas warme international 1989, V38(8), P480 CAPLUS
(41) Fritzsche; Gesamt-Emissionsmodell integrierter Systeme (GEMIS); Version 3.10 1999
(42) Gailfuss, M; Brennstoff-Warme-Kraft (BWK) 1998, V59(9), P39
(43) Gesellschaft fur rationelle Energienutzung mbH; Hessen-Energie, Klein-BHKW - erste Erfahrungen 1998
(44) Gonsior, B; Analyse von Energiebedarfsstrukturen in Hotelbetrieben 1997
(45) Houghton, J; Climate Change- The IPCC scientific assessment 1991
(46) IfE DLR FZJ; Ganzheitliche Systemuntersuchung zur Energiewandlung durch Brennstoffzellen, Abschlussbericht 1998, FVV98
(47) Jager, B; Programmgruppe Systemforschung und Technologische Entwicklung 1998, P67
(48) Klein, H; VDI Fortschritt-Berichte 2000, Reihe 19; 123
(49) Klien, J; Praxis Kraft-Warme-Kopplung. Planungshilfe Blockheizkraftwerke; 1. Auflage 1991, V3
(50) Knappstein, H; Erdol-Erdgas-Kohle 1994, V110(5), P216 CAPLUS
(51) Kolmetz, S; Energieverbrauchsstrukturen im Sektor Haushalte 1995, V17
(52) Lange-Husken, M; Ermittlung der Lastganglinien bei der Benutzung elektrischer Energie durch die bundesdeutschen Haushalte wahrend eines Jahres 1985
(53) Lezuo, A; Entwicklungsstand und Anwendungen der Brennstoffzellentechnik 1997, V8
(54) Lezuo, A; Personliche Auskunft Firma Siemens 1998
(55) Ludwig-Bolkow-Systemtechnik GmbH; Emissionsbilanzierung ausgewahlter Wasserstoff-Versorgungspfade; Abschlussbericht 1999
(56) Mugge, G; VDI-Fortschrittsberichte, Reihe 1993, V19(69)
(57) Nast, P; Euroheat & Power--Fernwarme International 1996, 7/8, P425

(58) Nitsch; Wirtschaftliches und ausschopfbares Potential der Kraft Warme-Kopplung in Baden-Wurttemberg 1994
(59) Nitsch, J; Abteilung Systemanalyse und Technikbewertung (STB) 1994
(60) Nitsch, J; Elektrizitatswirtschaft 1998, V97(24), P50
(61) Potter, R; Fachbereich TEE der Universitat/Gesamthochschule Essen 1993
(62) Recknagel, H; Taschenbuch fur Heizung und Klimatechnik; 68. Auflage 1997
(63) Rippel, R; Tagungsband: Energieversorgung mit Brennstoffzellenanlagen '98 - Stand und Perspektiven 1998
(64) Rouvel; Energieverbrauchsstrukturen im Sektor Kleinverbraucher 1995, V18
(65) Rouvel; Typgebaude IKARUS, Programmgruppe Technologiefolgenforschung (TFF) 1996
(66) Sawillion, M; Brennstoff-Warme-Kraft (BWK) 1994, V46(11/12), P499 CAPLUS
(67) Schmitz, K; Kraft-Warme-Kopplung: Anlagenauswahl -- Dimensionierung - Wirtschaftlichkeit -- Emissionsbilanz; 1. Auflage 1995
(68) Scholta, J; Elektrie 1994, V48(10), P410
(69) Suttor, W; Praxis Kraft-Warme-Kopplung. Technik, Umfeld und Realisierung von KWK-Anlagen; 1. Auflage 1996
(70) Unverzagt, G; Dissertation, Institut fur Energieverfahrenstechnik 1995
(71) VDEW; Analyse und Prognose des Stromverbrauchs der privaten Haushalte 1990-2010 1994
(72) VDEW-Arbeitsausschuss Marktforschung; Datenkatalog zum Haushaltsstromverbrauch 1997 1997, M-37/97
(73) VDI-Gesellschaft Energietechnik; Brennstoff-Warme-Kraft (BWK); Sondernummer I 1999
(74) VDI-Gesellschaft Technische Gebaudeausrustung; VDI-Richtline 1988, V2067(Blatt 7)
(75) Verband der Industriellen Energie- und Kraftwirtschaft (VIK); Brennstoffzellen 1999, VIK-Bericht Nr 214
(76) Voss; Konventionelle Warmeerzeuger 1996, P1
(77) Wagner, H; Brennstoffzellen - Funktion, Entwicklungsstand und Einsatzmoglichkeiten 1999
(78) Wagner, H; Vorlesungsunterlagen des Fachgebiets fur okologisch vertragliche Energiewirtschaft 1996
(79) Winkler, W; Brennstoff-Warme-Kraft (BWK) 1992, V44(12), P533 CAPLUS
(80) Winkler, W; Brennstoff-Warme-Kraft (BWK) 1999, V51(5/6), P110 CAPLUS
(81) Winkler, W; VGB Kraftwerkstechnik 1995, V75(6), P509 CAPLUS
(82) Zapp, P; Dissertation 1998, Jul-3497

L88 ANSWER 21 OF 34 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2000-421903 [36] WPIX
DNN N2000-314767 DNC C2000-127502
TI Fuel cell system for vehicles includes an alcohol source of low molecular weight, e.g. methanol, which is supplied upon shutdown of the cell to protect against freezing.
DC L03 X16
IN FULLER, T F; WHEELER, D J
PA (ITFU-N) INT FUEL CELLS LLC
CYC 1
PI US 6068941 A 20000530 (200036)* 4 H01M008-00
ADT US 6068941 A US 1998-177331 19981022
PRAI US 1998-177331 19981022
IC ICM H01M008-00

AB US 6068941 A UPAB: 20000801
NOVELTY - A fuel cell system includes an alcohol supply tank (52) containing a source of low molecular weight alcohol, preferably methanol or ethanol, for **controllably** supplying to the **water** circulating loop, upon shut-down of the fuel cell, an alcohol needed to prevent the water from freezing at a predetermined temperature.
DETAILED DESCRIPTION - A fuel cell system comprises stack of fuel cells comprising a proton exchange membrane (8), cathode catalyst (20), anode catalyst (12) disposed on opposing sides of the membrane, and coolant water flow fields adjacent to one of the anode and cathode sides of each membrane; blower (30) for supplying a controlled flow of oxidant to the cathode (18) through the cathode reactant flow field so that the alcohol diffusing from the water circulating loop to the cathode catalyst is oxidized, producing heat which warms the fuel cell; a coolant water circulating loop including a pump (38); and an alcohol supply tank (52) containing a source of low molecular weight alcohol for **controllably** supplying to the **water** circulating loop, upon shut-down of the fuel cell, an alcohol needed to prevent the water from freezing at a predetermined temperature, preferably -40 deg. C. An INDEPENDENT CLAIM is also included for a method of operating the fuel cell system comprising:
(a) upon shut-down of the fuel cell, introducing a low molecular weight alcohol into the coolant water circulating loop; and
(b) at the beginning of the start-up sequence, introducing a limited flow of oxidant into the cathode reactant flow field to combust the alcohol and generate a heat which raises the fuel cell temperature.
USE - For use in vehicles.
ADVANTAGE - Alcohol introduced into the **fuel cell** system **protects** the **fuel cell** against **freezing** especially in sub-**freezing** environments.
DESCRIPTION OF DRAWING(S) - The drawing shows a schematic diagram a fuel cell system.
proton exchange membrane 8
anode catalyst 12
cathode 18
cathode catalyst 20
pump 38
heat exchanger 40
alcohol supply tank 52
Dwg.1/1
FS CPI EPI
FA AB; GI
MC CPI: L03-E04; L03-H05
EPI: X16-C

L88 ANSWER 22 OF 34 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2001-068106 [08] WPIX
DNN N2001-051938
TI Fuel cell system for e.g. moving vehicle, has pump and coolant branch pipe that collect coolant currently pooled in fuel cell based on **detection** signal of **temperature** monitoring unit.
DC Q14 X16 X21

PA    (NSMO) NISSAN MOTOR CO LTD
CYC   1
PI    JP 2000324617    A  20001124 (200108)*       7    B60L011-18
ADT   JP 2000324617 A JP 1999-126060 19990506
PRAI JP 1999-126060         19990506
IC    ICM   B60L011-18
      ICS   H01M008-04
AB    JP2000324617 A UPAB: 20010207
      NOVELTY - A pump (14) and a coolant branch pipe (21) collect the coolant (13) currently pooled in a fuel cell (1), based on the **detection** signal of a **temperature** monitoring unit. The **temperature** monitoring unit **detects** the **temperature** of the heat carrier pooled in the fuel cell at the time of system stoppage.
      USE - For e.g. moving vehicle.
      ADVANTAGE - **Prevents damage** of the **fuel cell** by **freezing** of the heat carrier which remains in the fuel cell. Shortens the necessary warming up time at the time of restarting the system.
      DESCRIPTION OF DRAWING(S) - The figure shows the block diagram of the fuel cell system.
      Fuel cell 1
      Coolant 13
      Pump 14
      Coolant branch pipe 21
      Dwg.1/5
FS    EPI GMPI
FA    AB; GI
MC    EPI: X16-C09; X21-B01

L88  ANSWER 23 OF 34  CAPLUS  COPYRIGHT 2004 ACS on STN
AN    1999:576965  CAPLUS
DN    131:200299
ED    Entered STN:  14 Sep 1999
TI    Substantially fluorinated ionomers, their manufacture and use in conductive compositions
IN    Feiring, Andrew Edward; Doyle, Christopher Marc; Roelofs, Mark Gerrit; Farnham, William Brown; Bekiarian, Paul Gregory; Blau, Hanne A. K.
PA    E. I. Du Pont de Nemours & Co., USA
SO    PCT Int. Appl., 34 pp.
      CODEN: PIXXD2
DT    Patent
LA    English
IC    ICM   C08F214-22
      ICS   C07C317-18; C07C317-44; C07C311-48; C08L027-16; C08F214-22; C08F216-14
CC    35-4 (Chemistry of Synthetic High Polymers)
      Section cross-reference(s): 72
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | WO 9945048 | A1 | 19990910 | WO 1999-US4574 | 19990303 |

      W:  AL, AU, BA, BB, BG, BR, CA, CN, CU, CZ, EE, GD, GE, HR, HU, ID,

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            IL, IN, IS, JP, KP, KR, LC, LK, LR, LT, LV, MG, MK, MN, MX, NO,
            NZ, PL, RO, SG, SI, SK, SL, TR, TT, UA, US, UZ, VN, YU, AM, AZ,
            BY, KG, KZ, MD, RU, TJ, TM
        RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK,
            ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG,
            CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
     CA 2321695          AA    19990910        CA 1999-2321695  19990303
     AU 9929781          A1    19990920        AU 1999-29781    19990303
     EP 1060200          A1    20001220        EP 1999-911046   19990303
     EP 1060200          B1    20030115
         R:  AT, BE, DE, FR, GB, IT, NL, SE, IE, FI
     JP 2002505356       T2    20020219        JP 2000-534589   19990303
     AT 231169           E     20030215        AT 1999-911046   19990303
     NO 2000004334       A     20001030        NO 2000-4334     20000831
     US 2002045713       A1    20020418        US 2001-852381   20010510
     US 6667377          B2    20031223
PRAI US 1998-76578P      P     19980303
     US 1999-260204      B1    19990302
     WO 1999-US4574      W     19990303
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AB Substantially fluorinated but not perfluorinated ionomers, and related ionic and nonionic monomers, having vinylidene fluoride units and pendant groups containing fluorosulfonyl methide or fluorosulfonyl imide derivs. and their univalent metal salts, are used in electrochem. applications such as **batteries**, **fuel cells**, electrolysis **cells**, ion exchange membranes, **sensors**, electrochromic windows, electrochem. capacitors , and modified electrodes.  Thus,.

ST fluorinated ionomer conductive compn; vinylidene fluoride ionomer conductive compn; electrochem cell vinylidene fluoride ionomer; electrode vinylidene fluoride ionomer; sulfonyl methide perfluoroalkenyl vinylidene fluoride copolymer

IT Films
(elec. conductive; substantially fluorinated ionomers, manufacture and use in conductive compns.)

IT Electric conductors
(films; substantially fluorinated ionomers, manufacture and use in conductive compns.)

IT Electrochemical cells
Electrodes
(substantially fluorinated ionomers, manufacture and use in conductive compns.)

IT Fluoropolymers, preparation
Ionomers
RL: DEV (Device component use); IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); PREP (Preparation); USES (Uses)
(substantially fluorinated ionomers, manufacture and use in conductive compns.)

IT Fluoropolymers, uses
Polyoxyalkylenes, uses
RL: POF (Polymer in formulation); USES (Uses)
(substantially fluorinated ionomers, manufacture and use in conductive compns.)

IT 241485-97-2P

RL: IMF (Industrial manufacture); PREP (Preparation)
(analog to formation of a cyano-substituted methide ionomer; substantially fluorinated ionomers, manufacture and use in conductive compns.)

IT 241486-02-2P
RL: IMF (Industrial manufacture); PREP (Preparation)
(for debromination; substantially fluorinated ionomers, manufacture and use in conductive compns.)

IT 96-48-0 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 616-38-6, Dimethyl carbonate 623-53-0, Methyl ethyl carbonate
RL: NUU (Other use, unclassified); USES (Uses)
(ionomers with high affinity to; substantially fluorinated ionomers, manufacture and use in conductive compns.)

IT 108-32-7, Propylene carbonate
RL: NUU (Other use, unclassified); USES (Uses)
(liquid imbibed, ionomers with high affinity to; substantially fluorinated ionomers, manufacture and use in conductive compns.)

IT 109-77-3DP, Malonitrile, reaction products with perfluoroalkenyl sulfonyl copolymer 214690-34-3DP, reaction products with malonitrile, Li-exchanged
RL: IMF (Industrial manufacture); PRP (Properties); PREP (Preparation)
(propylene carbonate-imbibed; substantially fluorinated ionomers, manufacture and use in conductive compns.)

IT 241486-00-0P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(reaction with ammonia; substantially fluorinated ionomers, manufacture and use in conductive compns.)

IT 241486-01-1P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(reaction with bromine-**protected** perfluorosulfonyl fluoride ethoxy Pr vinyl ether; substantially fluorinated ionomers, manufacture and use in conductive compns.)

IT 421-85-2 30334-69-1
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction with bromine-**protected** perfluorosulfonyl fluoride ethoxy Pr vinyl ether; substantially fluorinated ionomers, manufacture and use in conductive compns.)

IT 16090-14-5 105214-13-9
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction with perfluoromethylsulfonylamine; substantially fluorinated ionomers, manufacture and use in conductive compns.)

IT 241485-94-9P
RL: DEV (Device component use); IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); PREP (Preparation); USES (Uses)
(substantially fluorinated ionomers, manufacture and use in conductive compns.)

IT 162105-59-1P 241485-96-1P 241485-98-3P 241485-99-4P
RL: IMF (Industrial manufacture); PREP (Preparation)
(substantially fluorinated ionomers, manufacture and use in conductive compns.)

IT 9002-84-0 9002-86-2, PVC 9011-14-7, PMMA 24937-79-9 25322-68-3
RL: POF (Polymer in formulation); USES (Uses)
(substantially fluorinated ionomers, manufacture and use in conductive compns.)
IT 7664-41-7, Ammonia, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(substantially fluorinated ionomers, manufacture and use in conductive compns.)
RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Desmarteau, D; US 5463005 A 1995 CAPLUS
(2) Desmarteau, D; JOURNAL OF FLUORINE CHEMISTRY 1995, V72(2), P203 CAPLUS
(3) Hydro Quebec; EP 0850920 A 1998 CAPLUS

L88 ANSWER 24 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1999:81655 CAPLUS
DN 130:127455
ED Entered STN: 08 Feb 1999
TI Resilient seal for membrane electrode assembly (MEA) in electrochemical **fuel cell** and fabrication of MEA with this seal
IN Barton, Russell H.; Gibb, Peter R.; Ronne, Joel A.; Voss, Henry H.
PA Ballard Power Systems Inc., Can.
SO PCT Int. Appl., 29 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM H01M008-24
ICS H01M008-02; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 39
FAN.CNT 2

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | WO 9904446 | A1 | 19990128 | WO 1998-CA687 | 19980715 |
| | W: AU, CA, DE, GB, JP, US | | | | |
| | RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE | | | | |
| | AU 9883293 | A1 | 19990210 | AU 1998-83293 | 19980715 |
| | US 6057054 | A | 20000502 | US 1998-116179 | 19980715 |
| | EP 1018177 | A1 | 20000712 | EP 1998-933412 | 19980715 |
| | EP 1018177 | B1 | 20020410 | | |
| | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI | | | | |
| | US 6190793 | B1 | 20010220 | US 1998-116178 | 19980715 |
| | JP 2001510932 | T2 | 20010807 | JP 2000-503567 | 19980715 |
| | EP 1156546 | A1 | 20011121 | EP 2001-119398 | 19980715 |
| | EP 1156546 | B1 | 20031008 | | |
| | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI | | | | |
| | AT 216138 | E | 20020415 | AT 1998-933412 | 19980715 |
| | CA 2243355 | AA | 19990116 | CA 1998-2243355 | 19980716 |
| | CA 2243355 | C | 20030916 | | |

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     CA 2243370          AA    19990116        CA 1998-2243370  19980716
PRAI US 1997-52713P      P     19970716
     EP 1998-933412      A3    19980715
     WO 1998-CA687       W     19980715
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AB The MEA comprises coextensive ion exchange membrane and electrode layers and a resilient fluid impermeable integral seal comprising a sealant material impregnated into the **porous** electrode layers in sealing regions of the MEA. In preferred embodiments, the integral seal circumscribes the electrochem. active area of the MEA. The integral seal preferably also extends laterally beyond the edge of the MEA, thereby enveloping the peripheral region including the side edge of the MEA. An integral seal may also be provided around any openings, such as manifold openings, that are formed in the MEA. Preferably the sealant material is a flow-processable elastomer applied to the MEA using an injection molding process prior to being cured. In preferred embodiments the seal has a plurality of spaced parallel raised ribs with cross ribs extending between them at spaced **intervals.** The raised ribs and cross ribs provide compartmentalized seals that provide improved **protection** against fluid leaks in a **fuel-cell** assembly.

ST resilient seal membrane electrode assembly **fuel cell**

IT Rubber, uses
RL: DEV (Device component use); USES (Uses)
(for resilient seal for membrane electrode assembly in **fuel cells**)

IT **Fuel cell** electrodes
Membranes, nonbiological
(resilient seal for membrane electrode assembly in **fuel cells**)

IT Seals (parts)
(resilient; for membrane electrode assembly in electrochem. **fuel cell** and fabrication of assembly with this seal)

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Ballard Power Systems; EP 0604683 A 1994 CAPLUS
(2) Beal, D; US 5523175 A 1996
(3) Daimler Benz AG; EP 0774794 A 1997 CAPLUS
(4) Int Fuel Cells Corp; WO 9203854 A 1992 CAPLUS
(5) Kaufman, A; US 4588661 A 1986 CAPLUS
(6) Koschany, A; WO 9833225 A 1998 CAPLUS
(7) Singelyn, J; US 5219674 A 1993 CAPLUS


L88 ANSWER 25 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN

AN 1997:148708 CAPLUS

DN 126:174233

ED Entered STN: 07 Mar 1997

TI **Hydrogen** absorbing alloy film composites for **battery** anodes and **fuel cells**

IN Fujino, Shuichi; Kanemoto, Manabu; Mizuguchi, Akio; Sugihara, Tadashi

PA Mitsubishi Materials Corp, Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF

DT Patent

LA Japanese
IC ICM H01M004-24
ICS H01M004-86; H01M004-90
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | JP 09007584 | A2 | 19970110 | JP 1995-150646 | 19950616 |
| | JP 3236907 | B2 | 20011210 | | |
| PRAI | JP 1995-150646 | | 19950616 | | |

AB The composites have a conductive substrates, perpendicular conductive partitions on the surface of the substrates, and H absorbing alloy films filled in the spaces between the partitions. The composites may have a conductive and H permeable **protective** film on the surface. This structure prevents separation of the H absorbing alloy from the substrate.
ST **battery hydrogen** absorbing alloy anode substrate;
**fuel cell hydrogen** absorbing alloy composite
IT **Battery** anodes
(structure of **hydrogen** absorbing alloy film composites with substrates containing perpendicular partitions for **battery** anodes)
IT **Fuel cells**
(structure of **hydrogen** absorbing alloy film composites with substrates containing perpendicular partitions for **fuel cells**)
IT 1333-74-0, **Hydrogen**, uses
RL: DEV (Device component use); USES (Uses)
(structure of **hydrogen** absorbing alloy film composites with substrates containing perpendicular partitions for **battery** anodes and **fuel cells**)

L88 ANSWER 26 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1997:346421 CAPLUS
DN 127:114449
ED Entered STN: 02 Jun 1997
TI Application of rare earth containing solid state ionic conductors in electrolytes
AU Kumar, R. V.
CS Department of Materials Science and Metallurgy, University of Cambridge, Pembroke Street, Cambridge, UK
SO Journal of Alloys and Compounds (1997), 250(1-2), 501-509
CODEN: JALCEU; ISSN: 0925-8388
PB Elsevier
DT Journal
LA English
CC 72-2 (Electrochemistry)
Section cross-reference(s): 76
AB Solid state ionic conductors have received considerable scientific attention and assumed great technol. significance in recent years, due to potentially important applications in **fuel cells**, **batteries**, **sensors**, electrochromics, process control, environmental **protection** and optical materials. Some of the

prominent electrolytes such as O ion conductors, β-aluminas and protonically conducting perovskites contain rare earth elements as vital constituents. Some novel application of rare earth containing solid state ionic conductors in **sensors** for gases and molten metals are discussed.

ST rare earth solid state ionic conductor; electrolyte oxide elec impedance cond

IT Electric conductivity
Electric impedance
Ionic conductors
Perovskite-type crystals
**Sensors**
Solid electrolytes
(application of rare earth containing solid state ionic conductors in electrolytes and **sensors** for)

IT 12267-97-9, Cerium strontium oxide cesro3
RL: DEV (Device component use); NUU (Other use, unclassified); PRP (Properties); USES (Uses)
(application of rare earth containing solid state ionic conductors in electrolytes)

IT 64417-98-7, Yttrium zirconium oxide
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(application of rare earth containing solid state ionic conductors in electrolytes)

IT 1314-23-4, Zirconium dioxide, properties 1314-36-9, Yttrium sesquioxide, properties
RL: PRP (Properties)
(application of rare earth containing solid state ionic conductors in electrolytes)

IT 1306-38-3, Cerium dioxide, reactions 1314-37-0, Ytterbium sesquioxide 1633-05-2, Strontium carbonate
RL: RCT (Reactant); RACT (Reactant or reagent)
(application of rare earth containing solid state ionic conductors in electrolytes)

IT 7446-09-5, Sulfur dioxide, analysis 7446-11-9, Sulfur trioxide, analysis 7647-01-0, **Hydrogen** chloride, analysis
RL: ANT (Analyte); ANST (Analytical study)
(application of rare earth containing solid state ionic conductors in electrolytes and **sensors** for)

IT 37226-47-4, Aluminum lanthanum oxide
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(application of rare earth containing solid state ionic conductors in electrolytes and **sensors** for)

L88 ANSWER 27 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1998:174691 CAPLUS
DN 128:277383
ED Entered STN: 25 Mar 1998
TI The vision of ionics
AU Weppner, Werner
CS Technical Faculty, Chr.-Albrechts University, Chair for Sensors and Solid State Ionics, Kiel, D-24143, Germany

SO Ionics (1995), 1(1), 1-4
CODEN: IONIFA; ISSN: 0947-7047
PB Institute for Ionics
DT Journal; General Review
LA English
CC 76-0 (Electric Phenomena)
AB A review with 5 refs. materials with fast ionic motion will have a major impact on the solution of some of our largest problems in areas of environmental **protection** and energy-storage, -conversion and -savings. A large variety of upcoming technologies is described which may not or not as well become realized without ionic materials. These include **sensors**, high performance **batteries**, electro-chromic windows and displays, **fuel** and water electrolysis **cells**, chemotronics, semiconductor ionics, electrocatalysis, thermoelec. converters and photogalvanic solar cells.
ST review ionic conductor application
IT Electric conductivity
Electric conductors
Ionic conductivity
Ionic conductors
(ionic conductors and their applications)
RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

(1) Hotzel, G; Solid State Ionics 1986, V18/19, P1223
(2) Hund, F; Z Electrochem 1951, V55, P363 CAPLUS
(3) Hund, F; Z phys Chem 1952, V199, P142 CAPLUS
(4) Nernst, W; Z Elektrochem 1899, V6, P41
(5) Wagner, C; Naturwiss 1943, V31, P265 CAPLUS
(6) Wagner, C; Personal communication, Conference on "Fast ion transport in solids" 1973
(7) Weppner, W; DE 2926172 1979 CAPLUS
(8) Weppner, W; Sensors and Actuators 1987, V12, P107 CAPLUS

L88 ANSWER 28 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1991:683518 CAPLUS
DN 115:283518
ED Entered STN: 27 Dec 1991
TI Contribution of electrochemistry to energy conservation and saving and environmental **protection**
AU Wiesener, Klaus; Rahner, Dietmar; Ohms, Detlef
CS Dresden Univ. Technol., Dresden, DDR-8027, Germany
SO Materials Science Monographs (1991), 65(Chem. Energy--1), 179-202
CODEN: MSMODP; ISSN: 0166-6010
DT Journal; General Review
LA English
CC 52-0 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 59, 60, 72
AB A review with 1 reference of new materials and processes in power sources and power storage development, energy utilization in tech. electrochem. processes, electrocatalysis and H power economy, environmental pollution **protection** in tech. electrochem. processes, electrochem. anal. for environmental control, electrochem. processing of liquid and solid wastes,

and current state of development of contribution of photoelectrochem. to energy production
ST review electrochem contribution energy saving; environment **protection** electrochem contribution review; **battery** power source review; **fuel cell** power source review; waste electrochem processing review; photoelectrochem energy prodn review; electrocatalysis **hydrogen** power review
IT Energy
(conservation and saving of)
IT Environmental pollution
(prevention of, contribution of electrochem. to)

L88 ANSWER 29 OF 34 JAPIO (C) 2004 JPO on STN
AN 1989-059776 JAPIO
TI **FREEZING PROTECTION** DEVICE FOR **FUEL CELL** POWER GENERATION PLANT
IN MOCHIMARU FUMIO
PA HITACHI LTD
HITACHI ENG CO LTD
PI JP 01059776 A 19890307 Heisei
AI JP 1987-215417 (JP62215417 Showa) 19870831
PRAI JP 1987-215417 19870831
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1989
IC ICM H01M008-04
AB PURPOSE: To prevent the freezing of instruments and instrument piping without the use of heating cable which may become an explosion firing source by **controlling** cooling **water temperature** in a branch pipe installed in an outlet exhaust **water** cooling pipe with a **temperature control** valve, and introducing the cooled **water** into a required part.
CONSTITUTION: The cooling water heated at 170∼200°C by cooling a fuel cell 12 is exhausted to an outlet exhaust cooling pipe 14, and part of it is supplied to a warm water branch line 15 installed in the pipe 14. The cooling **water temperature** is **controlled** with a liquid expansion type **temperature detector** 20, a **temperature controller** 21, and a **temperature control** valve 17 which is **controlled** with the **temperature controller** 21 installed in the line 15 to avoid overheating. The cooling **water** whose **temperature** is **controlled** is introduced into instrument piping 4 through a traced line 2. The freezing of instruments and instrument piping is safely prevented without the use of heating cable which may become an explosion firing source.
COPYRIGHT: (C)1989,JPO&Japio

L88 ANSWER 30 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1977:570453 CAPLUS
DN 87:170453
ED Entered STN: 12 May 1984
TI Halogen-fueled organic electrolyte **fuel cell**
IN Dey, Arabinda N.; Schlaikjer, Carl R.
PA Mallory, P. R., and Co., Inc., USA

SO U.S., 4 pp.
CODEN: USXXAM
DT Patent
LA English
IC H01M008-00
NCL 429029000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|---|---|---|---|---|
| PI | US 4037025 | A | 19770719 | US 1972-299557 | 19721020 |
| PRAI | US 1972-299557 | | 19721020 | | |

AB A **battery** comprises a halogen-fueled **porous** cathode, an active metal, e.g., Li, anode, and an organic electrolyte containing SO2, to improve the solubility of the halogen fuel, to prevent passivation of the elecrodes by the products of the reaction of the halogen with the active metal anode, and to **protect** the active metal anode from reacting directly with the halogen dissolved in the electrolyte. Thus, an electrolyte of ethylene carbonate and propylene carbonate containing LiI and I was prepared and the solubility of both solutes was greater than that observed conventionally when SO2 was dissolved in the system. The Li-I **battery** prepared with the electrolyte showed no signs of corrosion and passivation of the graphite cathode due to build-up of insol. products.
ST **battery** secondary lithium halogen; sulfur dioxide lithium **battery**
IT **Batteries**, secondary
(lithium-iodine, sulfur dioxide-containing organic-electrolyte)
IT 7439-93-2, uses and miscellaneous
RL: USES (Uses)
(anodes, in sulfur dioxide-containing organic-electrolyte **battery** with iodine cathode)
IT 7446-09-5, uses and miscellaneous
RL: USES (Uses)
(**battery** electrolyte containing, iodine-lithium)
IT 7553-56-2, uses and miscellaneous
RL: USES (Uses)
(cathodes, in sulfur dioxide-containing organic-electrolyte **battery** with lithium anode)

L88 ANSWER 31 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1975:114064 CAPLUS
DN 82:114064
ED Entered STN: 12 May 1984
TI Sealed nickel-**hydrogen** secondary cell
AU Giner, Jose; Dunlop, James D.
CS Tyco Lab., Waltham, MA, USA
SO Journal of the Electrochemical Society (1975), 122(1), 4-11
CODEN: JESOAN; ISSN: 0013-4651
DT Journal
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

AB A recently developed sealed Ni-H cell offers considerable promise to develop lightwt., long-life, rechargeable **batteries.** The advantages of this cell are its higher energy and power d. as compared with other rechargeable systems including Ni-Cd, Pb-acid, and Ag-Zn cells and the regenerative H-O **fuel cell.** The energy d. for lightwt. 50 A-hr cells is 28 W-hr/lb. The cell enjoys a unique overdischarge **protection** mechanism which allows for long cycle life at high depth of discharge. Exptl. data are presented to define the characteristics of the cell. Over 5000 high-rate cycles were completed on small 1.5 A-hr cells with good voltage performance. A 50 A-hr cell has completed to date over 800 cycles discharge to 70% of measured capacity in 1.2 hr.
ST nickel **hydrogen** secondary **battery**
IT **Batteries**, secondary
(nickel-**hydrogen**, lightwt. and long-life sealed)

L88 ANSWER 32 OF 34 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1971:414046 CAPLUS
DN 75:14046
ED Entered STN: 12 May 1984
TI **Hydrogen** electrodes with preactivated Raney powder as catalyst
AU Jung, Margarete; Von Doehren, Hans H.
CS Varta Forsch.-Entwicklungszent., Kelkheim/Taunus, Fed. Rep. Ger.
SO Metalloberflaeche (1971), 25(2), 42-4
CODEN: MOFEAV; ISSN: 0026-0797
DT Journal
LA German
CC 77 (Electrochemistry)
AB The manufacture of gas-diffusion (H) electrodes for **fuel cells** made from activated and stabilized Raney Ni catalyst powder is described. Powder activation is faster and more complete than activation of the catalyst in the finished electrode. Salts of oxyhalogen acids are used to stabilize the powder at room temperature thus furnishing **protection** against air oxidation during hot pressing of the electrodes. The electrodes can be stored in air indefinitely. The catalyst is reactivated by heating the electrodes in the **battery** at 80° in the presence of H. Electrodes made from preactivated Raney Ni powder can be loaded more heavily in continuous operation than any known up till now. Their electrochem. performance can be improved by the addition of small amts. of promoters. The most effective promoter addition was 1-5 mg/g of Raney alloy. Pt gave the best results followed by Pd and Cu.
ST **hydrogen** electrode **fuel cell**; catalyst preactivated **hydrogen** electrode; Raney nickel catalyst **hydrogen** electrode; activation catalyst **hydrogen** electrode
IT **Fuel cells**
(electrodes, with activated and stabilized Raney nickel catalysts)
IT Electrodes
(**fuel-cell**, with activated and stabilized Raney nickel catalysts)
IT 7440-06-4, uses and miscellaneous

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     RL: CAT (Catalyst use); USES (Uses)
        (catalysts, fuel-cell promoter for Raney nickel)
IT   7440-05-3, uses and miscellaneous   7440-50-8, uses and miscellaneous
     RL: CAT (Catalyst use); USES (Uses)
        (catalysts, fuel-cell, promoter for Raney nickel)

L88  ANSWER 33 OF 34  CAPLUS  COPYRIGHT 2004 ACS on STN
AN   1971:134203  CAPLUS
DN   74:134203
ED   Entered STN:  12 May 1984
TI   Coating gas diffusion electrodes for batteries and fuel
     cells
IN   Vignaud, Rene
PA   Societe les Piles Wonder
SO   Fr., 10 pp.
     CODEN: FRXXAK
DT   Patent
LA   French
IC   H01M
CC   77 (Electrochemistry)
FAN.CNT 1
     PATENT NO.        KIND  DATE          APPLICATION NO.  DATE
     ---------------   ----  --------      ---------------  --------
PI   FR 1601214              19700918      FR               19681231
AB   Title electrodes comprising a porous, waterproof layer
     transversed by a series of channels for gas circulation and 1 active layer
     on the 2 faces and having M1 exit and M1 entrance for the gas and a means
     of current collection are wrapped 1-6 times with sheets of liquid-retaining
     Inticell and (or) cellophane (e.g. 2 times with Inticell and then 6 times
     with cellophane) to protect the electrodes from reaction
     products of antagonistic electrodes.  Two electrodes in a plane can be
     wrapped with separator sheets simultaneously and the assembly bent into a
     U shape.
ST   gas diffusion electrode separators; cellophane sheets electrode coverings;
     Inticell sheets electrode coverings
IT   Fuel cells
        (electrodes, with cellophane coating)
IT   Electrodes
        (fuel-cell, with cellophane coating)

L88  ANSWER 34 OF 34  JAPIO  (C) 2004 JPO  on STN
AN   2003-288928    JAPIO
TI   FUEL CELL SYSTEM
IN   OGAWA SOICHIRO
PA   NISSAN MOTOR CO LTD
PI   JP 2003288928 A  20031010 Heisei
AI   JP 2002-88075 (JP2002088075 Heisei) 20020327
PRAI JP 2002-88075        20020327
SO   PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2003
IC   ICM  H01M008-04
     ICS  H01M008-10
AB   PROBLEM TO BE SOLVED: To provide a fuel cell system
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which **protects** the system from **freezing** of water at a
stoppage of the fuel cell, and has an excellent restarting responsiveness.
SOLUTION: This fuel cell system is equipped with a first protection mode
preventing freezing of water inside the system by heating water supplied
to the **fuel cell**, and a second **protection**
mode preventing **freezing** of **water** inside the system by
**draining water** from the fuel cell. A **controller**
20 calculates energy required when the system is protected with the first
protection mode and energy required when the system is protected with the
second protection mode based on a restarting predicted time and an outside
temperature transition, and protects the system by selecting the
protection mode having a smaller amount of required energy.


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